**VSB — TECHNICAL UNIVERSITY OF OSTRAVA**
**FACULTY OF ECONOMICS**

DEPARTMENT OF FINANCE

# Ocenění společnosti Tencent za zohlednění podmínek rizika
# Valuation of the Tencent Company under the Risk Conditions

Student: BC. TianZhen Jiang
Supervisor of the diploma thesis: Ing. Petr Gurný, Ph.D

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# Diploma Thesis Assignment

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Description:

1. Introduction
2. Description of the Valuation Process Methodology
3. Basic Financial Characteristics of Tencent Company
4. Estimation of the Market Value Probability Distribution of Analysed Company
5. Conclusion

Bibliography
List of Abbreviations
Declaration of Utilization of Results from the Diploma Thesis
List of Annexes
Annexes

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Ing. Iveta Ratmanová, Ph.D.
*Head of Department*

prof. Dr. Ing. Dana Dluhošová
*Dean of Faculty*

## The declaration

"Herewith I declare that I elaborated the entire thesis, including all annexes, independently."

Ostrava June 26th, 2015

JIANG TIANZHEN

Tianzhen Jiang

# Contents

# 1. Introduction

This thesis is focused on valuation analysis of Tencent Company in social networking services (SNS) industry. The goal of the thesis is to estimate the probability distribution of the market value of Tencent company.

In finance, valuation is the process of estimating the worth of something ,which can be done not only on assets but also on liabilities. In order to do the valuation analysis of the Tencent Company in social networking services industry, we need main resources such as fundamental analysis, industry analysis and financial reporting. Through the valuation analysis of the Tencent company in social networking services industry, the value of the company can be calculated and the trend of the development of the company can be predicted.

The main purpose of this thesis is using the valuation analysis to analysis the value of the Tencent company in financial markets. In this thesis ,it uses the historical data from 2009 to 2013 and predicts the development of the Tencent company instant messenger industry in 2014-2016. In chapter 2, theoretical part, the methodology of the valuation process will be introduced. The main content includes general description of company valuation, financial plan, discounted cash flow method, cost of capital and sales revenues prediction. In chapter 3, the Industry analysis part, it is based on the observation that profit margins vary between industries, which can be explained by the structure of an industry and it introduces the main products of the Tencent company in social networking services industry which is Tencent QQ. In this part, another important introduction is the SWOT analysis and business strategies analysis of the Tencent QQ. Usually in the SWOT and business strategies analysis, through SWOT analysis the strategies analysis, compared with other competitors, we can know the strength, weakness, opportunities and threats of the Tencent company in social networking services industry. The purpose of Industry analysis is to determine

the attractiveness of an industry. In chapter 4, there is an estimation part of the expected market value of Tencent company in social networking services industry. There is a calculation with the methods which are mentioned in the chapter 2. After the estimation of the expected market value, the results of the expected market value and the book value should be compared. Then, we can make sensitivity analysis of the indicators which can influence the valuation. The chapter 5 is a conclusion and a overall of the thesis . In this part, the results to the Tencent company data analysis in social networking services industry from the chapter 1 to chapter will be told about possibly. Last but not least, the future prediction and the purpose of the development of the company in the instant messenger industry can be made on comments.

# 2. Description of the valuation process methodology

In this chapter, the methodology of the valuation process will be introduced. The main content includes general description of company valuation, financial plan, discounted cash flow method, cost of capital and sales revenues prediction.

## 2.1 General description of company valuation

In finance, valuation of a company is the process of estimating the value of this company. Items that can be usually valued are a financial asset or liability. Valuations can be done through asset approach such as stocks, options and intangible assets or through liability approach such as bonds . Valuation can be done for many reasons and there are a lot of method to do the valuation. In this thesis, it mainly introduce three main items which are usually estimated in the valuation: Fair market value (FMV); Investment value; Intrinsic (fundamental) value.

**Fair market value** is defined, Hitchner (2011, p.3), as "the price at which the property would change hands between a willing buyer and a willing seller, neither being under any compulsion to buy or to sell and both having reasonable knowledge of relevant facts."

**Investment value** can be defined, Hitchner (2011, p.5), as "the value to a particular investor based on individual investment requirements and expectations." Investment value of a company is mainly based on the investor and his subjective expectations.

**Intrinsic (fundamental) value** can be generally defined as the true (real) worth of an item, based on evaluation of available facts. It usually refers to the value of a company, stock, currency or product determined through fundamental analysis without reference to its market value. It is usually based on fundamental analyses of

publicly traded company and used for investment decision (whether buy, sell or hold the stock).

In order to do the valuation, there are three main approaches which will be introduced in thesis: The income approach; The asset approach; The market approach.

**The income approach**, which is defined by Hitchner (2011, P122), is "the income approach is a mathematical fraction consisting of a numerator and a denominator. The numerator represents the future payments of an investment, and the denominator represents the quantification of the associated risk and uncertainty of those future payments''. There are three different methods in income approach, including DCF (discounted future cash flow) method, capitalized income method and EVA (economic value added) method. The result of a value calculation under income approach is generally the fair market value of a company. It's a forward-looking approach and most widely used.

**The asset approach** determines a company's value, Hitchner (2011, P309), by "presenting the value of all the tangible and intangible assets and liabilities of the company". The asset approach focuses more on assets and liabilities of a company. But it`s difficult for the assets approach to get access to some intangible assets.

**The market approach** is also called as forward - looking approach. This approach is generally defined as "The value of the business can be determine by reference to reasonably comparable companies, for which values are known".

In this thesis, we will also use DCF methods to do the two - stages valuation. DCF is discounted cash flow, which is usually refers to using the present value (PV) to estimate the cost of capital (WACC) and future free cash flow. In this thesis, we will use three historical date to do the financial plan in the future.

## 2.2 Financial Plan

The financial plan is about the future development of the relevant items in the financial statements and usually refers to the cash flow statement, balance sheet and income statement. Generally financial plan includes plan of sales, plan of the operation profit margin (OPM), plan of net working capital, plan of investment and plan of funding.

**Plan of the sales**

The sales strategic can come from the SWOT analysis. The main goal of planning the sales is to estimate the total sales potential of the company and forecast of the sales. Sales prediction refers to the simple time analysis of the sales evolution and it comes from the external and internal potential.

**Plan of the earning before interest and tax ( EBIT )**

Operating profit is also known as EBIT and is found on the company's income statement. EBIT is earnings before interest and taxes. And we can calculate the EBIT as following,

$$EBIT = Revenue - Operating expenses + Nonoperating\ income \quad (2.1)$$

The operating profit margin looks at *EBIT* as a percentage of sales. The operating profit margin ratio is a measure of overall operating efficiency, incorporating all of the expenses of ordinary, daily business activity. Plan of OPM is to assess the relationship between changes in cost and volume of production. The calculation is as following,

$$Operating \quad margin \quad = \frac{EBIT}{Revenue} \tag{2.2}$$

Where in formula (2.2), the operating profit margin refers to the *EBIT* and the *sales*. *EBIT* is the earning before the tax and interest. Both of *EBIT* and *sales* can be found in the income statement.

To plan of the operating profit margin, we can use the historical data from the annual income statement. Because of some fluctuations, the growth rate of the operating margin is unstable. With the historical data, we can calculate the average number as the growth rate of the operating profit margin in the future. And then we can use the plan of sales and plan of the operating profit margin to calculate the plan of EBIT in the future. The calculation for the weighted average operating profit margin is as following,

$$k = \sum_{i=1}^{t} ki \cdot wi \tag{2.3}$$

Where in formula (2.3), *k* is the weighted average operating profit margin, *ki* is the operating margin at the time; *wi* is the given weight to operating margin at the time. In addition, different years get the different weights for the weighted operating profit margin, but the sum of all the weights for the operating profit margin in these years must be equal to 1.

**Plan of net working capital (NWC)**

Net working capital (NWC) is an important instruments to measure the short-term liability of business. It can be calculated by the current assets minus the current liabilities which we can collect from the balance sheet in the historical annual reports. The calculation for the net working capital is as following,

$$\textit{Net working capital} = \textit{Current assets} - \textit{Current liablities} \quad (2.4)$$

The plan of net working capital can reveal the relationship between changes in the items of the net working capital and the volume of the productions. Working capital can be the inventory or the receivables. In order to do the plan of the net working capital in the future, we need calculate the growth rate for the current assets and current liabilities. The calculation for the growth rate can be as following,

$$r_A = \frac{CA_{t+1} - CA_t}{CA_t} \quad (2.5)$$

Where in formula (2.5), $r_A$ is the growth rate of the current asset, $CA_t$ is the current assets in the year t and $CA_{t+1}$ is the current assents in the t+1 year.

$$r_L = \frac{CL_{t+1} - CL_t}{CL_t} \quad (2.6)$$

Where in formula (2.6), $r_L$ is the growth rate of the current asset, $CL_t$ is the current liabilities in the year t and $CL_{t+1}$ is the current liabilities in the (t+1) year.

In order to plan the net working capital, we should plan of the current assets and current liabilities firstly. To plan the current assets,we need calculate all the growth rate in the years we selected. Then we can calculate the weighted average growth rate of current assets. After that we can use the weighted average growth rate multiple the current asset to get the results of planning of current asset. Then we can predict the current liabilities in the same way. Finally, we can get the prediction of the current assets and current liabilities. And we can use the plan of current assets minus the plan of current liabilities to get the plan of the net working capital.

**Plan of investments and depreciation**

Investment is an important items in the company's balance sheet. It is a part of asset that generally can take the profit or loss to a company. The main approach for the plan of the investments is depreciation approach which requires that Investments should be higher than depreciation. Because if the depreciation is higher than investment, several years later, the company won't have fixed assets, and can't afford any operating activities,which leads to company bankrupt. So let investment no smaller than depreciation is necessary.

**Plan of funding (financing)**

The main goal of this part is to decide what resources are necessary to ensure the financial equilibrium. And it includes the plan of expected loans (long-term debts), loan repayments, interest repayments and equity changes.

## 2.3 Discounted cash flow method

Discount cash flow method (DCF) is one of an basic method in the valuation. It's usually use to valuate the value of a company which is determined by the future free cash flows which is discounted by the cost of capital which is working with the time value.

### 2.3.1 Basic introduction to DCF method

Discount cash flow (DCF) method is often used to valuate a project, a company or the asset which are using the concepts of the time value of money. The basic function for the DCF method is as following,

$$V = \sum_{t=1}^{\infty} \frac{FCF_t}{(1+R)^t} = \frac{FCF}{R} \tag{2.7}$$

In the formula (2.7), the $V$ is the expected value of company, $FCF$ is the free cash flow, $R$ is the cost of capital and the $t$ is the specific time during the valuation process.

### 2.3.2 Two-stage DCF method

Two-stage DCF method is used for predicting the discounted cash flow in the two stages. The first stage is calculated by the historical data and the second stage is the prediction of the discounted cash flow in the future.

Two-stage DCF method is much more use for prediction. In this thesis, we will valuate the value of Tencent Company by using two-stage DCF method. Totally we divided the development of the Tencent company into two stages. The first stage is the we will use the historical data from 2014 to 2016, and the second stage is from the year 2017 to infinity. So we will use two different costs of capitals to calculate the different discounted value into different period. And we assume the company will continue to developing in the future, so we will use the grow rate ($g$) for second stage's calculation into our two-stage DCF method. The function for the two-stage method is as following,

$$V = \sum_{t=1}^{T} \frac{FCF_t}{(1+R_1)^t} + \frac{FCF_{T+1}}{R_2 - g} \cdot (1+R_1)^{-T} \tag{2.8}$$

Where in the formula (2.8), $R_1$ is the cost of capital in the first stage; $R_2$ is the cost of capital for the second stage; $g$ is the growth rate for the second stage; $t$ is the

specific time during the valuation process in the first stage and $T$ is the length of the first phase; $V$ is the market value of the company.

After that we can estimate the book value of the company in two phases as following,

$$V = V_1 + V_2 \tag{2.9}$$

Where in the formula (2.9), $V$ is the estimated market value of the company; $V_1$ is the market value of the company in the first stage and $V_2$ is the matket value of the company which will be estimated in the second stage.

In the formula of two-stage DCF method the FCF's calculation is very important. In valuation, free cash flow (FCF) is usually used to measure the distribution among the securities holders of the company. In terms of calculating FCF, we will calculate the value of FCF which includes free cash flow to firm (FCFF), free cash flow to equity (FCFE) and free cash flow to debt (FCFD). Generally, FCFF is a sum of FCFE and FCFD.

Free cash flow to firm (FCFF) is a part of FCF, which is usually used to measure the performance of the company's working in the net amount of the cash. The calculation of FCFF is as following,

$$FCFF = EBIT \cdot (1\text{-}t) + DEP\text{-}\Delta EP\text{-}\Delta NNV \tag{2.10}$$

Where in the formula (2.10), $FCFF$ is the free cash flow to firm, $EBIT$ is the earning before the interest and tax, $t$ is the tax rate for the company, $DEP$ is the depreciation for the fix assets of the company, $\Delta NWC$ is the changes in the net working capital and $INV$ is the investment of the company.

Free cash flow to equity (FCFE) is another part of FCF, which is used to measure the amount of cash that can be paid to the equity shareholders of the company after the expense, reinvestment and debt repayment. The calculation of the FCFE is as following,

$$FCFE = EAT + DEP\text{-}\Delta EP\text{-}\Delta NNV + \Delta S \tag{2.11}$$

Where in the formula (2.11), *FCFE* is the free cash flow to equity, *EAT* is the earning after tax, *DEP* is the depreciation for the fix assets of the company, $\Delta NWC$ is the changes in the net working capital, *INV* is the investment of the company and $\Delta S$ is the net borrowing.

Free cash flow to debt (FCFD) is also a part of FCF. It's usually equal to FCFF minus FCFE. And it's used to measure the amount of money which can be used to pay the debt for the company. The calculation of FCFD is as following,

$$FCFD = -\Delta S + I(1\text{-}t) \tag{2.12}$$

Where in the formula (2.12), *FCFD* is the free cash flow to debt, $\Delta S$ is the net borrowing for the company, *I* is the investment of the company and *t* is the tax rate for the company.

In order to make the prediction for the FCF. We could predict the FCFF and FCFE respectively. To make the financial plans, we cam use two-stages DCF method to predict. Meanwhile, we need calculate the growth rate and cost of capital for the stages. To calculate the cost of capital, we will use weighted average cost of capital (WACC) model in this thesis.

## 2.4 Cost of capital

In finance, the cost of capital is a sum of the company's cost of equity and and cost of debt. It can be defined by the Brealy &al (Principles of Corporate Finance, Chapter 10) as "the required rate of return on a portfolio company's existing securities".

The weighted average cost of capital (WACC) which is often used in measure a company's cost of capital is usually used to valuate the discount value of the company. And the calculation of WACC refers to tax rate, assets of the company ,value and cost of equity and debt in the company. The calculation of the WACC is as following,

$$WACC = R_E \cdot \frac{E}{A} + (1-t) \cdot R_D \cdot \frac{D}{A} \tag{2.13}$$

Where in formula (2.13), $WACC$ is the weighted average cost of capital, $R_E$ is the cost of equity, $E$ is the value of the company's equity, $A$ is the total assets of the company, $t$ is the tax rate of the company, $R_D$ is the cost of the debt and $D$ is the debt of the company.

### 2.4.1 Estimating cost of equity

Cost of equity which is also called cost of common stock, it is a required rate of return on common shareholders. It's usually regarded as the sum of risk free rate of return and the premium expected for risk in the building-up approach. There are several other types of models can used to calculate the cost of equity such as CAPM model, Arbitrage model and Gordon model. In this thesis, we will mainly use the CAPM model to calculate the cost of capital.

Capital asset pricing model (CAPM), which is used to estimate the required rate of a company's assets, is defined by Jack Treynor (1961, 1962) French, Craig W. (2003) as "The Treynor Capital Asset Pricing Model" and is developed by Markowitz and Merton Miller. This model takes the company's market risk which is the asset's sensitivity to non-diversifiable risk into consideration. In the CAPM model, there is an quantity beta which represents the non-diversifiable risk help us determine the cost of equity.

In the CAPM model, the security market line (SML) is a factor which refers to the market risk and expected return. SML illustrates the relationship between the expected return on assets and the market risk. And in the model we can calculate the reward-to-risk ratio which represents the relationship between the market and securities. Finally, we can build the CAPM model. The calculation for expect return on equity is as following,

$$E(R_E) = R_f + \beta_E[E(R_m)-R_f] \qquad (2.14)$$

Where in formula (2.14), $E(R_E)$ is the expected return on equity, $R_f$ is the risk free rate, $\beta_E$ represents the stock's sensitivity to the market; $E(R_m)$ is the expected return of the market and $[E(R_m)-R_f]$ is the market risk premium.

Expected return on equity is a useful variable in the valuation which is used to measure the company's profitability and help the investor make the decision making. The expected return is usually refers to shareholders, value of the company, dividends and investment.

Risk free rate is return which an investor expected from the investment in a specific period time with no risk of financial loss. Risk free rate is a high significant factor in the CAPM model. It often used in the specific situation that can definitely

bring the profit to the investors without any risk of loss. A risk-free products may be issued by a government or a agency which has too low risks of default that can be ignored.

$\beta_E$ is a coefficient that can represents the sensitivity of the stock to the market. It is usually varies across companies, and it can be calculated as following,

$$\beta_E = \frac{Cov(R_E, R_m)}{Var(R_m)} \tag{2.15}$$

Where in formula (2.15), $\beta_E$ is the sensitivity of the stock to the market, $Cov(R_E, R_m)$ is the correlation between expected return on equity and expected return of market, $Var(R_m)$ is the variance of the expected return of market.

Risk premium is the difference of the money between the expected return on the risky assets and the assets without risks. It's usually calculated by expected return of the market minus expected on the risk-free assets. The expected rate of return of the market is usually estimated by the portfolios which are calculated by the historical data.

### 2.4.2 Estimating cost of debt

In valuation, cost of debt ($R_D$) is the interest payments which comes from the company's financial borrowing. It's an important component which is used to do calculation in the weighted average cost of capital model. Generally, the cost of debt refers to the long-term corporate bonds.

The cost of debt can be calculate refers to the interest rate paid which can be valuated by the risk-free rate plus a risk component that includes the credit risk. The calculation of the cost of debt is as following,

$$R_D = (R_f + credit\ risk\ rate)(1\text{-}t) \tag{2.16}$$

Where in formula (2.16), $R_D$ is the cost of the debt, $R_f$ is the risk free rate and $t$ represents the tax rate for the company.

Yield to maturity of the securities is another factor which we can use to estimate the cost of debt. It represents that the company promise the internal rate of return (IRR) to the investors until the maturity. Generally, we use the yield to maturity to calculate the long-term bonds for the company. The calculation is as following,

$$P = \frac{coupon}{(1+ytm)} + \frac{coupon}{(1+ytm)^2} + \ldots + \frac{Face\ value + coupon}{(1+ytm)^n} \tag{2.17}$$

Where in formula (2.17), $P$ represents the price of bonds, *coupon* is the dividends which the investors can get from the bonds according to the maturity, *ytm* is the yield to maturity and $n$ is the year for the bonds which are hold by the investors.

Another the situation for calculating the cost of debt refers to the profitable companies, the debt of which is discounted by the tax rate. The calculation is as following,

$$Cost\ of\ Debt = \frac{Annual\ Interest\ Payment}{Market\ Value\ of\ Debt} \tag{2.18}$$

Where in the formula (2.18), the calculation of the cost of debt refers to the cost after the tax.

## 2.5 Sales revenues prediction

In sales revenue prediction, we will choose 10000 different kinds of random risk to estimate the future value of the sales revenue. In order to estimate the random evolution of sales revenue and generate random numbers we can use Monte Carlo method and apply it in Excel. Monte Carlo method is a method of calculation that depends on repeated random sampling to obtain numerical results. From this model, we can take an advantage of the special module to generate random numbers for a prespecified probability distribution.

In order to predict the random evolution of sales revenue, we can use the function of Excel by: *Data*→ *Data Analysis* → *Random Number Generation*.

Where in Excel, we generate sales revenue as the variables, and we choose 10000 different scenarios to predict the different trends of development of the sale revenue for Tencent company in next 5 years. Then we should choose the normal distribution that its parameter of mean is 0 and its parameter of standard deviation is 1 for these random numbers. After that, we should choose a blank place for these 50000 random numbers' output range. At last, we should pressed "ok", then we can get the 50000 random number which are generated in the output range place with the normal distribution.

After generating the random numbers, we should check the correlation between the variables. We can calculate the expected logarithmic return as follows,

$$R(i) = ln \frac{S_t}{S_{t-1}} \tag{2.19}$$

Where in formula (2.19), *R(i)* is the expected logarithmic return for *i* and *St* is the value of *i* at time *t*.

If the correlation between the logarithmic returns is very high, we need to fix the random variables to respect the random variables by using Cholesky decomposition. In this case, we can calculate for each scenario according to the Cholesky decomposition as follows,

$$\vec{z}^{T} = \vec{e}^{T} \cdot p \tag{2.20}$$

Where in formula (2.20), $\vec{z}^{T}$ is the vector of independent random variables and *p* is the upper triangular matrix.

According to the random number created by Monte Carlo simulation, we can calculate the upper triangular matrix P. The upper triangular matrix P can be estimated as follows,

$$p_{ii} = (\sigma_{ii} - \sum_{k=1}^{i-1} p^2 ki)^{\frac{1}{2}} \qquad for\ i = 1,2,3 \cdots N \tag{2.21}$$

$$P_{ij} = (\sigma_{ij} - \sum_{k=1}^{i-1} p_{ki} \cdot p_{kj}) \cdot p_{ii}^{-1} \qquad for\ 1 \le i \le j \le N \tag{2.22}$$

$$p_{ij} = 0 \qquad for\ i \ge j \tag{2.23}$$

If we need fix the correlation between random numbers, we can use the P matrix. The value of the numbers in the P matrix can be calculated in formula (2.21), formula (2.22) and formula (2.23). Where in the formulas above, $\sigma$ is the standard deviation, *p* is the value in the upper triangular matrix. Using these formulas above, we can

estimate the correlation between random numbers. Hence, we can do the evaluation of independent variables in the future by using some indicators as follows,

$$\mu = ln\frac{S_t}{S_{t-1}} \tag{2.24}$$

$$\alpha = \mu - \frac{\sigma^2}{2} \tag{2.25}$$

Where in formula (2.24) and formula (2.25), $\mu$ represents the continuous logarithmic return, $\sigma$ is the standard deviation of continuous return. Hence, we can continue to do random evolution prediction.

In the random evolution prediction, we usually use the Monte Carlo simulation for future free cash flow. At first, we generate random value $\tilde{z}$ from the standard normal distribution for each random scenario. The procedure is done by means of the *Random Number Generation* in Excel. Input data in the *Random Number Generation*. Here, *Number of Variables* states the number of independent scenarios and *Number of Random Numbers* states the number of steps for each scenario.

Random evolution of the sales revenue

$$S_t = S_{t-1} \cdot \exp(\alpha \cdot \Delta t + \sigma \cdot \tilde{z} \cdot \sqrt{\Delta t}) \tag{2.26}$$

Mean value of the sales revenue

$$E(S_T) = S_0 \cdot \exp(\mu \cdot \Delta t \cdot n) = S_0 \cdot \exp(\mu \cdot T) \tag{2.27}$$

Variance of the sales revenue

$$\text{var}(S_T) = S_0^{\,2} \cdot (2 \cdot \alpha \cdot \Delta T \cdot n) \cdot [\exp(\sigma^2 \cdot \Delta t \cdot n) - 1] \tag{2.28}$$

Here $d\tilde{z}$ is a random component, with $d\tilde{z} = \tilde{z} \cdot \sqrt{\Delta t}$ , and $\tilde{z}$ is a random value from the standard normal distribution N(0;1), *exp* is an excel function which is the returns *e* raised to the power of a given number; $\sigma$ is the standard deviation from the continuous logarithmic returns.

The profit margin is mostly used for internal comparison. It is difficult to accurately compare the net profit ratio for different entities. Individual businesses' operating and financing arrangements vary so much that different entities are bound to have different levels of expenditure, so that comparison of one with another can have little meaning. A low profit margin indicates a low margin of safety: higher risk that a decline in sales will erase profits and result in a net loss, or a negative margin.

$$Net\ profit\ margin = \frac{net\ profit}{revenue} \tag{2.29}$$

# 3. Instant Messenger Industry analysis of Tencent company

Industry analysis is a very useful tool for business analysis. It is based on the observation that profit margins vary between industries, which can be explained by the structure of an industry. Usually we use the is the Five Forces Framework of the industry analysis the sectors. The purpose of Industry analysis is to determine the attractiveness of an industry. Through the Industry analysis we can know a starting point for formulating strategy , after knowing the SWOT of the company we can have a better understanding the competitive landscape in which a company operates.

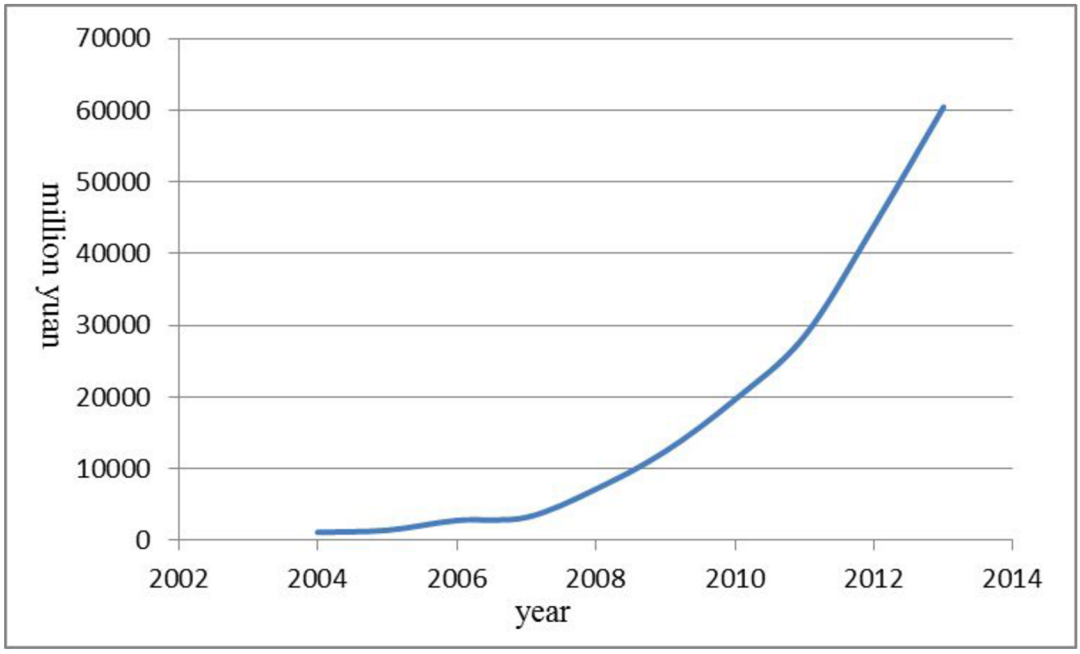
## 3.1 The overview of Tencent company in social networking services industry

Tencent company is founded in November, 1998. Tencent has grown into one of China's largest and most used Internet service portal. Now Tencent is the world's third largest Internet firm. Since its establishment over the last decade, Tencent has maintained steady growth under its user-oriented operating strategies. On June 16, 2004, Tencent Holdings Limited (SEHK 700) went public on the main board of the Hong Kong Stock Exchange. The market value of Tencent company has quadrupled to $50 billion over the past 2- years. In order to keep the development of the company, Tencent is aggressively diversifying away from the highly competitive online gaming industry and into China's social networking, e-commerce and mobile search engine sector. In addition, Tencent company has involved in a lot of markets, such as social networking market ( SNS ) and social messenger market ( SMS ). In thesis, we will mainly consider about the situation of Tencent QQ in the SNS market.

In social networking services (SNS) industry, there are several social networking services which are recommended by the Tencent company, including QQ zone, QQ

pengyou and QQ microblog. In the past ten yeats, Tencent QQ has developed itself quickly and influenced the ways of communication by the hundreds of millions of Internet users. It also creates new applications constantly and brings more and more possibilities of a wider range of applications in chinese social networking services industry.

Chart 3.1 Historical revenue of Tencent company




Source: Annual report of Tencent company from 2004 to 2013

Where in chart (3.1), we can see the trend of development of the historical revenue for Tencent company. The sales revenue increased slowly between 2005 to 2007, after 2007 the sales revenue of Tencent company increased very quickly. It reached even more than 60000 million yuan in the 2004.

## 3.2 The competitors with the Tencent QQ in the chinese market

Though Tencent QQ has earned a lot in Chinese social networking market, it has a lot of competitors and faces many kinds of risks, including managing its partners, content regulations and strong competition from rivals such as Baidu Inc, SINA Corp

and Alibaba.com. Baidu, China's No.1 search engine, has increased its focus on e-commerce and online video. SINA runs the country's top microblogging site, a Twitter-like product that Sina is bent on expanding further. Alibaba is China's No. 1 e-commerce company.

Figure 3.1 Ranking of SNS in China in 2013

SNS in China

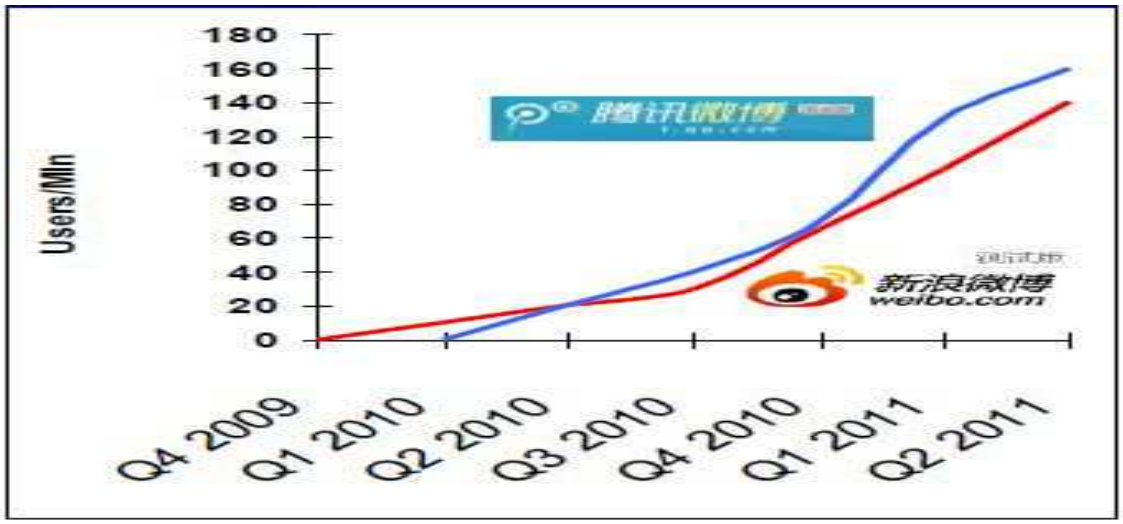
| | Name | Webpage | Registered Accounts | Global Alexa ranking |
|---|---|---|---|---|
| 1 | QQ | Qzone.qq.com | 376,000,000 | 17 |
| 2 | 51 | www.51.com | 130,000,000 | 359 |
| 3 | Baidu | tieba.baidu.com | 110,000,000 | 11 |
| 4 | Xiaonei | www.xiaonei.com | 40,000,000 | 168 |
| 5 | Kaixin | www.kaixin001.com | 30,000,000 | 135 |
| 6 | Baidu Kongjian | hi.baidu.com | 27,500,000 | 11 |
| 7 | Ipartment | www.ipart.cn | 22,000,000 | 4,489 |
| 8 | 360quan | www.360quan.com | 11,000,000 | 2,932 |
| 9 | Wangyou | www.wangyou.com | 10,000,000 | 412 |
| 10 | Tongxue | www.tongxue.com | 10,000,000 | 3,493 |
| 11 | Baihe | www.baihe.com | 9,000,000 | 10,763 |
| 12 | Zhanzuo | www.zhanzuo.com | 7,000,000 | 12,872 |
| 13 | Myspace | www.myspace.com | 6,000,000 | 9 |
| 14 | Douban | www.douban.com | 2,000,000 | 372 |
| 15 | Tianji | www.tianji.com | 1,500,000 | 10,695 |
| 16 | Wealink | www.wealink.com | 1,500,000 | 15,285 |
| 17 | Facebook | www.facebook.com | 1,452,000 | 5 |
| 18 | Friendster | www.friendster.com | 1,100,000 | 47 |
| 19 | Linkedin | www.linkedin.com | 1,026,000 | 110 |
| 20 | Hainei | www.hainei.com | 1,000,000 | 16,363 |

© www.web2asia.com

Source from: http://marcchow.com/international-social-media-strategies-158.html

In the ranking of Credit for the social networking survice, Tencent's QQ aggregated SNS access the NO.1 among all social networks in China. But in the Global Alexa ranking, Tencent's QQ ranks the 17th, it faced with a lot of competitive products which can be in the top 10 in the world such as Myspace, Facebook, Friendster and Linkedin.

Figure 3.2 Competition between Tencent and Sina




Source from http://www.nomura.com/europe/resources

The figure (3.2) above illustrates the competition between Tencent Microblog and Sina Weibo which are the leaders in the social networking services in chinese market. The blue lines is the trend of Tencent Microblog's development and the red line is the trend of Sina Weibo's development. From the figure we can get the information that Tencent Microblog and Sina Weibo both drive the rapid growth after 2010, but the speed of increase users of Tencent Microblog is a little bit faster.

## 3.3 The Structure of Tencent business profit

The profit margin is mostly used for internal comparison. It is difficult to accurately compare the net profit ratio for different entities. Individual businesses' operating and financing arrangements vary so much that different entities are bound to have different levels of expenditure, so that comparison of one with another can have little meaning. A low profit margin indicates a low margin of safety: higher risk that a decline in sales will erase profits and result in a net loss, or a negative margin.

In order to measure the profitability of Tencent company, the data belows will be used for calculate net profit margin.The way to calculate net profit margin is

according to formula (2.29).

Figure 3.3 Income statement of Tencent company

| Period Ending | Dec 31, 2013 | Dec 31, 2012 | Dec 31, 2011 | Dec 31, 2010 |
|---|---|---|---|---|
| **Total Revenue** | **60,437,000** | **43,894,000** | **28,496,000** | **19,646,000** |
| Cost of Revenue | 27,461,000 | 18,207,000 | 9,928,000 | 6,320,000 |
| **Gross Profit** | **32,976,000** | **25,686,000** | **18,568,000** | **13,326,000** |
| Operating Expenses | | | | |
| Research Development | - | - | - | - |
| Selling General and Administrative | - | - | - | - |
| Non Recurring | - | - | - | - |
| Others | - | - | - | - |
| Total Operating Expenses | 42,929,000 | 28,966,000 | 17,191,000 | 10,047,000 |
| **Operating Income or Loss** | **17,508,000** | **14,928,000** | **11,305,000** | **9,599,000** |
| Income from Continuing Operations | | | | |
| Total Other Income/Expenses Net | - | - | - | - |
| Earnings Before Interest And Taxes | 17,508,000 | 14,928,000 | 11,305,000 | 9,599,000 |
| Interest Expense | (394,000) | (327,000) | (73,000) | (35,000) |
| Income Before Tax | - | - | - | - |
| Income Tax Expense | 3,718,000 | 2,266,000 | 1,874,000 | 1,798,000 |
| Minority Interest | (61,000) | (53,000) | (22,000) | (62,000) |
| Net Income From Continuing Ops | 15,563,000 | 12,785,000 | 10,225,000 | 8,115,000 |
| Non-recurring Events | | | | |
| Discontinued Operations | - | - | - | - |
| Extraordinary Items | - | - | - | - |
| Effect Of Accounting Changes | - | - | - | - |
| Other Items | - | - | - | - |
| **Net Income** | **15,502,000** | **12,732,000** | **10,203,000** | **8,054,000** |
| Preferred Stock And Other Adjustments | - | - | - | - |

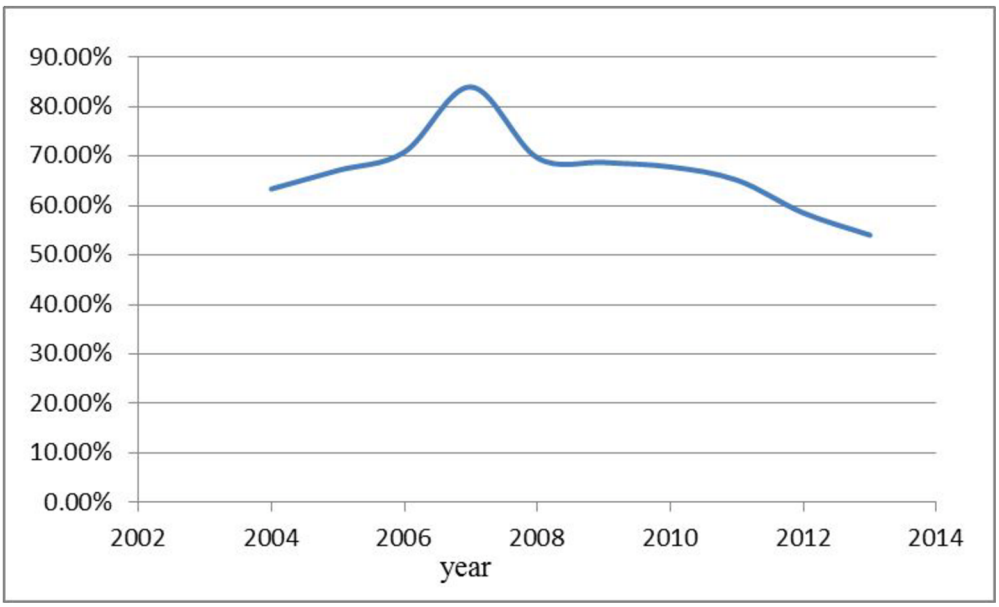
Source from: Annual Report 2013

Table 3.1 The result of net profit margin

Million yuan

| Year | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 |
|---|---|---|---|---|---|---|---|---|---|---|
| total revenue | 1144 | 1426 | 2800 | 3218 | 7155 | 12440 | 19646 | 28496 | 43894 | 60437 |
| net profit | 725 | 957 | 1983 | 2703 | 4984 | 8550 | 13326 | 18568 | 25687 | 32659 |
| net profit margin | 63.37% | 67.11% | 70.82% | 84.00% | 69.66% | 68.73% | 67.83% | 65.16% | 58.52% | 54.04% |

Chart 3.2 Net profit margin




In the chart above, it describes the the net profit margin of Tencent company in recent years. The net profit margin increased between 2004 and 2007 and fell down after 2007. Combined with the data in the figure, it can be concluded that the reason leading this trend is the net profit cannot grow as fast as the total revenue after 2007. To sum up, if the Tencent company wants to keep the net profit grows stably, it should take some measures such as improving the technology and developing the new software.

## 3.4 SWOT analysis of Tencent company.

SWOT analysis is a structure planning model which is often used to measure the strength, weakness, opportunities and threats of a company.

**Strengths** are defined as the characteristics of the business or project that give it an advantage over others.

**Weaknesses** are called as the characteristics that place the business or project at a disadvantage relative to others.

**Opportunities** are the elements that the project could exploit to its advantage

**Threats** are the elements in the environment that could cause trouble for the business or project.

Figure 3.4 SWOT analysis of Tencent company

| | |
|---|---|
| STRENGTH<br>1) on platform. It is one of the oldest Internet corporations in China. It has over 1 billion registers. And the number of its users at one moment has passed 100 million.<br>2) on its diverse products .Tencent has various products based on the QQ number.<br>3)On researching and development ability. Tencent has mature technology and rich experience. In 2007 Tencent established China's first Internet institute -Tencent Research Institute whose chief task is the research and development of core technology on Internet.<br>4) on capital .According to the statistics of 2010, Tencent is the 3rd largest internet operator in the world and the largest in China . | WEAKNESS<br>1) from its diverse products .Some of Tencent's products and services hate the similar functions Therefore; different departments of Tencent have competition for users. Besides, since Tencent have so many users, the diverse products also need a larger data processing system.<br>2) lacking the ability of self- innovation. Many products and services of Tencent are imitating from other companies' most popular products and services. |
| OPPOTUNITY<br>1) Globalization .At the end of 2010, Tencent published QQ International which aims at get the international market share.<br>2) The rapid development of mobile phone Internet. Tencent has its own mobile phone softwares, like mobile QQ, QQ Input for mobile phone and so on. | THREATS<br>1) Threats from innovation. As previous paragraph has stated, many Tencent's products are imitating from the most popular services of other company. Thus the innovation of other company make Tencent could only follow other popular company.<br>2) Competition from its monopoly status. A very obvious example is the battle between Tencent and 360. This indicated that Tencent are facing urgent crisis and competition. |

Source from http://connection.ebscohost.com/c/articles/93283466/tencent-holdings-limited-swot-analysis

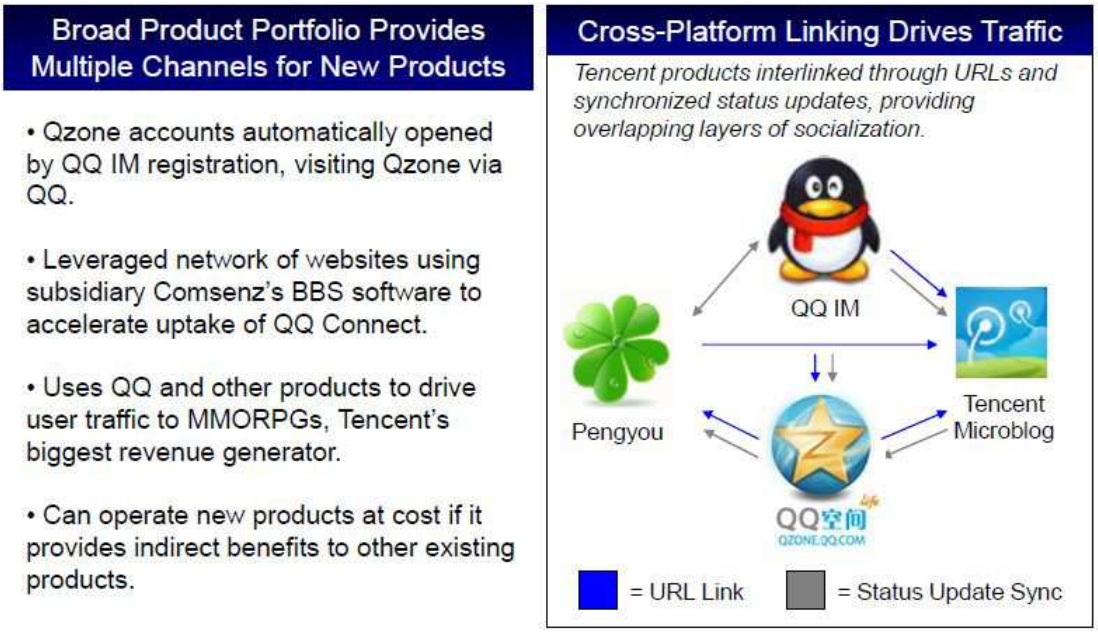
## 3.5 Business strategies of Tencent company

The Internet market is very competitive, in order to stand in the market, Tencent company must have it strategies and develop them.

### 3.5.1 Products strategies

Tencent QQ accelerated the mobilisation of our services and reinforced its leadership in mobile applications in China. Building on its strengths in communications and social platforms on mobile devices, Tencent QQ extended the user base of various mobile applications, such as news, music and utilities, and launched new services on its core mobile platforms, such as Game Center and Weixin Payment, which enhanced user engagement, while opening up monetisation opportunities.

Figure 3.5 Product strategies of Tencent QQ




Source from http://yiyouhuang.blogspot.cz/2013/02/as-i-mentionedin-last-blog-tencent-inc_10.html

Tencent QQ also extended its leadership in social networking services industry, while extenting its products such as QQ zone and QQ xiaoyou with the online advertising business and e-Commerce transactions business .

### 3.5.2 Cooperation strategies

In September 2013, Tencent built a strategic partnership with Sogou for its search business, under which it invested in Sogou and merged its SoSo search-related businesses and certain other assets with Sogou.

In March 2014, Tencent announced a strategic partnership with JD.com for its e-Commerce business, under which Tencent invested in JD.com and merged its relevant e-Commerce initiatives with JD.com.

### 3.5.3 Strategies outlook

In the future development, Tencent company will improve its technology and expend its broad market and provide consumers with the better service to build a prosperous ecosystem. Tencent aim to deepen its relationships with strategic business partners such as CSC, JD.com and Sogou,among others, providing its partners with its full platform support and bringing their products and services to its users.

# 4. Estimation of the expected market value of Tencent company

In this chapter we will do the application of the methods which we have recommended in the chapter 2. First of all, we will do the sales revenues prediction by using market size prediction and market share prediction for 5 years. And then we can make the financial plans for Tencent company. Also we will do the cost of capital calculation and the estimation of valuation. Finally, there will be a sensitivity analysis which includes the analysis of sensitivity of growth rate and sensitivity of WACC. In addition, there will be a sensitivity analysis of relatively changes of growth rate and WACC as well.

## 4.1 Sales revenues prediction

In this part, we will do the sales revenue prediction by using regression model. To build the regression model, OLS Metthod will be used in this chapter. Using this method, we can do the data analysis to find the proper data which can be the variables that have an influence on the Tencent company's development in the future. After that, the market share predictions will be done by Flexible Logistic Model. Last but not least, the sales revenue prediction will be done in the end of this chapter.

### 4.1.1 Sales revenue regression

In this part, we will use the regression model to predict the development of sales for Tencent company in chinese social networking services (SNS) market. To predict the sales revenue, we will use the OLS Model. By using this model, we will choose some data from the website of National Bureau of Statistics of the People`s Republic of China. Then we will pick up the proper variables as independent variables which can have influence on the sales revenue of Tencent sales revenue to build a linear regression model with the dependent variable which is Tencent sales revenue.

Table 4.1 Statistic data for calculation

| Year | Tencent revenue (million yuan) | Population (million) (year-end) | Gross Domestic Product (GDP) (million yuan) | Consumer Price Index | Total Employed Persons(Million) | Average wage in urban units(yuan) | Total Export (million yuan) | Total wage of employees in urban city (million yuan) | Fix assets investment in all the society (million yuan) | Technology Market Turnover( million yuan) | Coporate income tax(million yuan) | Consumer price level (yuan) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2004 | 1144 | 12998.8 | 15987833.79 | 103.9 | 742.64 | 9421.6 | 4643580 | 1761500 | 7047743 | 133436 | 395733 | 5032 |
| 2005 | 1426 | 13075.6 | 18493736.9 | 101.8 | 746.47 | 10493 | 5427370 | 2062710 | 8077361 | 155137 | 534392 | 5596 |
| 2006 | 2800 | 13144.8 | 21631442.59 | 101.5 | 749.78 | 11759.5 | 6337686 | 2426230 | 1099816 | 181818 | 703960 | 6299 |
| 2007 | 3218 | 13212.9 | 26581030.38 | 104.8 | 753.21 | 13785.8 | 7330010 | 2947150 | 13732394 | 222653 | 877925 | 7310 |
| 2008 | 7155 | 13280.2 | 31404542.71 | 105.9 | 755.64 | 15780.8 | 7952653 | 3528950 | 17282840 | 266523 | 1117563 | 8430 |
| 2009 | 12440 | 13345 | 34090281.26 | 99.3 | 758.28 | 17174.7 | 6861837 | 4028820 | 22459877 | 303900 | 1153684 | 9283 |
| 2010 | 19646 | 13409.1 | 40151279.52 | 103.3 | 761.05 | 19109.4 | 9469930 | 4726990 | 25168377 | 390658 | 1284354 | 10522 |
| 2011 | 28496 | 13473.5 | 47310404.86 | 105.4 | 764.2 | 21809.8 | 11316140 | 5995470 | 31148513 | 476356 | 1676964 | 12570 |
| 2012 | 43894 | 13540.4 | 51947009.92 | 102.6 | 767.04 | 24564.7 | 11480096 | 7091420 | 37469474 | 643707 | 1976953 | 14110 |
| 2013 | 60437 | 13607.2 | 56884520.98 | 102.6 | 769.77 | 26955.1 | 12103746 | 9306430 | 44629409 | 746913 | 2242720 | 15632 |

Where in the table (4.1), there are data from the website of National Bureau of Statistics of the People`s Republic of China. The data of the sales revenue of Tencent company which we can pick up from the annual report of Tencent company. These data will be used for data analysis in order to build the regression model. The data from table (4.1) includes:

**Tencent revenue:** The more revenue in Tencent company, the better development of Tencent company.

**Population:** The more population can lead the more consumption of Internet service so that population of China has some relationship with the sales revenue of Tencent company.

**Gross Domestic Product (GDP):**Tencent product belongs to the Internet social service industry which contributes to the GDP, so we can predict the higher the GDP may lead to the higher of the sales revenue.

**Consumer Price Index (CPI):** Consumer price index is a index that can reflect that the price of products and the service which is usually consumed by the normal family, the higher CPI, the higher consumer price level of the normal family. It indicates the higher ability of the consumption in the family and potential increase in the Tencent sales revenue.

**Total Employed Persons:** Total employed persons can predict the production scale, the more employed persons in China indicates more employed persons in each company and the better production scales and economic scales in Tencent company. It predicts more potential revenue in Tencent company.

**Average wage in urban units:** Average wage in urban units is the level of income for citizens. The higher average wage can increase the more potential to the consumption of Tencent products.

**Total Export:** The total export increases may indicate that there is a increase in Tencent company. The more export of Tencent company, the more sales revenue it has.

**Total wage of employees in urban city:** Total wage of employees in urban units is an indicator of the development of the companies in the society. The higher total wage of employees in urban city may include the situation of Tencent company. The improvement of the employees in Tencent company may indicate the increase in Tencent sales revenue.

**Fix assets investment in all the society:** Fix assets investment is a important part of the investment, more investment in all the society may include more investment in Tencent company. More investment in Tencent company indicates more sales revenue in the company.

**Technology Market Turnover:** Technology market turnover is a important indicator in the development of the technology market. Tencent company belongs to the Internet social service industry, it need to continue creating the new software and developing its technology. The technology market turnover is higher may mean the higher technology and the better development in Tencent company. It may lead the growth in Tencent sales revenue.

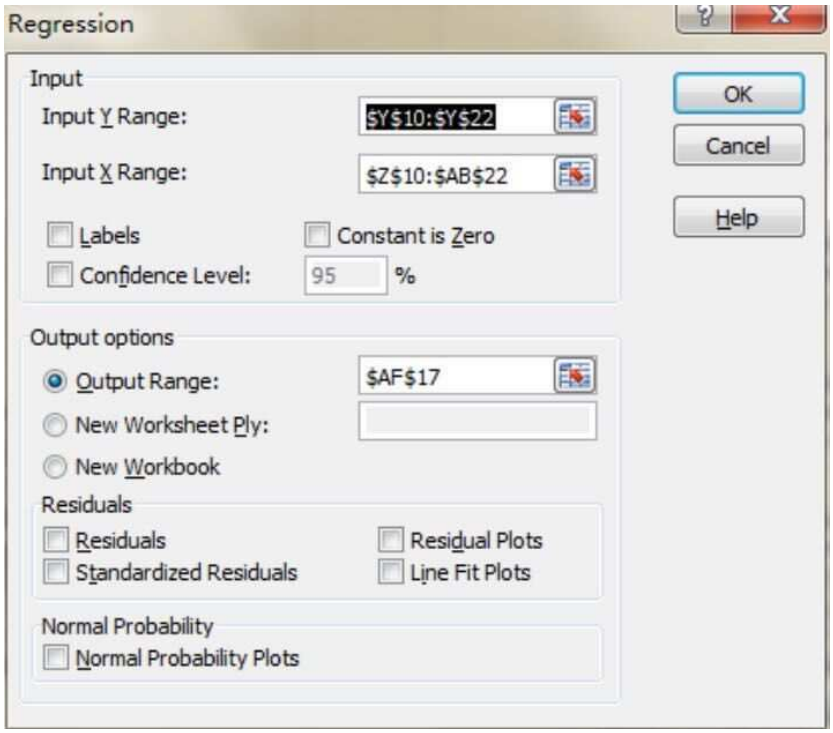
**Corporate income tax:** Becaues of the stability of the corporate income tax rate, more corporate income tax in the company, more sales revenue the company has.

**Consumer price level:** Consumer price level is the consumption ability of the family. The higher consumer price level, the higher consumption ability of the normal family. It indicates the potential increase in the Tencent sales revenue.

To build up the function, we need use two vectors as the the dependent variable y and independent variable x respectively. In this model, we determinate to regard sales revenue as the dependent variable y and use Excel function “Data Analysis” to find the independent variable x which can be picked up from table (4.1).

In order to pick out the data, we need to regress out the sales revenue. In order to regress out the sales, Excel function can be used. The step is: *Data → Data Analysis → Regression*

Image 4.1 Regression function




Where in the image (4.1), we need put changes in sales revenues $\Delta R$ into "*input Y Range*" and *sales revenue* into "i*nput X Range*", and select the "*output range*" in any blank place of Excel. Then we need press "*OK*" and we can get the result of the regression function. In this regression model, the sale revenue and the changes in the sales revenue must have some correlation so that we can use this regression directly. In order to select the proper scenario for the further evaluation, we can use the significant level at 0.05.

Image 4.2 Data analysis for Scenario One

| *Regression statistic* | |
|---|---|
| Multiple | 0.991315314 |
| R Square | 0.982706051 |
| Adjust square | 0.977764923 |
| Standard error | 3040.180301 |
| Observations | 10 |

ANOVA

| | *df* | *SS* | *MS* | *F* | *significancet F* |
|---|---|---|---|---|---|
| Regression | 2 | 3676428991 | 1838214495 | 198.882928 | 6.80189E-07 |
| Residual | 7 | 64698873.83 | 9242696.261 | | |
| Total | 9 | 3741127864 | | | |

| | *coefficient* | *Standard error* | *t Stat* | *P-value* | *Upper 95%* | *lower 95%* |
|---|---|---|---|---|---|---|
| Intercept | -11830.66368 | 4773.219978 | -2.478549853 | 0.042299859 | -23117.53539 | -543.791959 |
| Export | -0.001707439 | 0.001140636 | -1.496917839 | 0.178078371 | -0.004404614 | 0.000989737 |
| Total wage | 0.010040841 | 0.001246514 | 8.055138058 | 8.72357E-05 | 0.007093304 | 0.012988378 |

Image 4.3 Data analysis for Scenario Two

| *Regression statistics* | |
|---|---|
| multiple R | 0.99192194 |
| R square | 0.98390915 |
| Adjusted R square | 0.97931176 |
| Standard error | 2932.52511 |
| observation | 10 |

ANOVA

| | *df* | *SS* | *MS* | *F* | *significant F* |
|---|---|---|---|---|---|
| Regression | 2 | 3680929940 | 1840464970 | 214.0149327 | 5.28477E-07 |
| Residual | 7 | 60197924.63 | 8599703.518 | | |
| Total | 9 | 3741127864 | | | |

| | *coefficients* | *Standard error* | *t Stat* | *P-value* | *upper 95%* | *lower%* |
|---|---|---|---|---|---|---|
| Intercept | -16161.42497 | 1941.308617 | -8.325015834 | 7.06229E-05 | -20751.89041 | -11570.95954 |
| Investment | -0.000260705 | 0.000266888 | -0.976832937 | 0.361194459 | -0.000891795 | 0.000370385 |
| Tech-turnover | 0.11261451 | 0.017787307 | 6.33117272 | 0.00039224 | 0.070554213 | 0.154674806 |

Image 4.4 Data analysis for Scenario Three

| *Regression statistics* | |
|---|---|
| Multiple | 0.988372 |
| R Square | 0.97688 |
| Adjusted R square | 0.970274 |
| Stand error | 3515.171 |
| Observations | 10 |

ANOVA

| | *df* | *SS* | *MS* | *F* | *significant F* |
|---|---|---|---|---|---|
| Regression | 2 | 3654632864 | 1827316432 | 147.8838654 | 1.87914E-06 |
| Residual | 7 | 86495000.58 | 12356428.65 | | |
| Total | 9 | 3741127864 | | | |

| | *coefficients* | *Standard error* | *t Stat* | *P-value* | *upper 95%* | *lower 95%* |
|---|---|---|---|---|---|---|
| Intercept | 2369183 | 526301.3716 | 4.501570086 | 0.002793071 | 1124677.523 | 3613687.497 |
| population | -188.936 | 41.31899321 | -4.572626238 | 0.002566117 | -286.6402059 | -91.23241911 |
| Average wage | 9.563069 | 1.395919268 | 6.850732033 | 0.00024183 | 6.26224429 | 12.8638934 |

From image (4.2), image (4.3) and image (4.4), we can pick up some suitable data for the regression model. In order to pick up the suitable variables we creat three scenarios randomly by Excel function " *Data Analysis*". In the images above, we can compare *p-values* among the scenarios. The *p-value* must smaller than 0.05 so that only *Scenario Three* is available.

Table 4.2 Statistic data for regression model

| | y | $x_1$ | $x_2$ |
|---|---|---|---|
| year | Revenue (million yuan) | population | Average wage |
| 2004 | 1144 | 12998.8 | 9421.6 |
| 2005 | 1426 | 13075.6 | 10493 |
| 2006 | 2800 | 13144.8 | 11759.5 |
| 2007 | 3218 | 13212.9 | 13785.8 |
| 2008 | 7155 | 13280.2 | 15780.8 |
| 2009 | 12440 | 13345 | 17174.7 |
| 2010 | 19646 | 13409.1 | 19109.4 |
| 2011 | 28496 | 13473.5 | 21809.8 |
| 2012 | 43894 | 13540.4 | 24564.7 |
| 2013 | 60437 | 13607.2 | 26955.1 |

In this case we can see that according P-value the parameter of linear model are statistically at the 5% probability level and we can get the vectors for the regression model. Hence, we can get the linear regression model for the sales revenue as following,

$$Sales\ revenue = -188.911 Population + 9.558 Average\ wage + 2368940.550 \quad (4.1)$$

Where in the formula (4.1), *Sales revenue* is the sales revenue of Tencent company (million yuan), *Population* is Population of Chinese Republic from the year to the end (million), *Average wage* is Average wage in urban units (yuan), in the formula (4.1), we can conclude that the population has the negative relationship with Tencent sales revenue but.the average wage has the positive relationship with the Tencent sales revenue.

### 4.1.2 Random evolution of sales revenue

In order to estimate the random evolution of sales revenue and generate random numbers we can use Monte Carlo method and apply it in Excel. Monte Carlo method is a method of calculation that depends on repeated random sampling to obtain numerical results. From this model, we can take an advantage of the special module to generate random numbers for a prespecified probability distribution.

In order to predict the random evolution of sales revenue, we can use the function of Excel by: *Data* → *Data Analysis* → *Random Number Generation*.

Where in *Excel*, we generate 5 years' revenue as the variables, and we choose 10000 scenarios to predict the different trends of development of the sale revenue for Tencent company in next 5 years. Then we should choose the normal distribution that its parameter of mean is 0 and its parameter of standard deviation is 1 for these random numbers. After that, we should choose a blank place for these 50000 random numbers' output range. At last, we should pressed "*ok*", then we can get the 50000 random number which are generated in the output range place with the normal distribution.

After obtaining these data, we can got 10000 random numbers for each predictive year. Each random number represents one type of risk. Then we can put each number into formula (4.1) to compute the evolution of independent variables evaluations for the 10000 scenarios so that we can have 10000 possibilities of the trend for Tencent's development. After we put all the random numbers into the formula, we will have 50000 random sales revenue into next 5 years. Here we choose 10 random scenarios from the 10000 scenarios to predict the sales revenue as in next 5 years.

If the correlation between the logarithmic returns is very high, we need to fix the random variables to respect the random variables by using Cholesky decomposition. In formula (2.19) we can calculate the logarithmic returns as follows,

Table 4.3 Logarithmic returns

| log R (Population) | Log R (Average wage) |
|---|---|
| 0.005890852 | 0.107703443 |
| 0.005278345 | 0.113953056 |
| 0.005167382 | 0.158977652 |
| 0.005080579 | 0.135154934 |
| 0.004867579 | 0.084643359 |
| 0.004791798 | 0.10674299 |
| 0.004791212 | 0.132179049 |
| 0.004953016 | 0.118951043 |
| 0.004921255 | 0.092862066 |

After calculate the logarithmic returns, we can use Excel function to calculate the correlations between variables: *Data→ Data Analysis → Correlation*. Then we can get the result of the correlation as follows,

Table 4.4 Correlation between logarithmic returns

| | *log R (Population)* | *Log R (Average wage)* |
|---|---|---|
| log R (Population) | 1 | |
| Log R (Average wage) | 0.072458444 | 1 |

According to table (4.4), we can see the correlation between logarithmic returns is *0.0725* which represents that the correlation between logarithmic return is small enough and we don't need fix the random variables.

After checking the correlation between logarithmic returns, we can see the correlation between random variables as follows,

Table 4.5 Correlations of random values from 2014 to 2018

| | *Pop2014* | *Average W(2014)* |
|---|---|---|
| Pop2014 | 1 | |
| Average W(2014) | -0.007120397 | 1 |

| | *Pop2015* | *Average W(2015)* |
|---|---|---|
| Pop2015 | 1 | |
| Average W(2015) | -0.00781315 | 1 |

| | *Pop2016* | *Average W(2016)* |
|---|---|---|
| Pop2016 | 1 | |
| Average W(2016) | -0.012952334 | 1 |

| | *Pop2017* | *Average W(2017)* |
|---|---|---|
| Pop2017 | 1 | |
| Average W(2017) | -0.001095121 | 1 |

| | *Pop2018* | *Average W(2018)* |
|---|---|---|
| Pop2018 | 1 | |
| Average W(2018) | -0.002338822 | 1 |

From table (4.5) we can see that the correlation between random value of *Population* and *Average wage* is very small and not same. According to table (4.4) and table (4.5), the correlations are very small. In this case, we can accept the random

numbers with normal distribution which we create by Excel function *Random Number Generation*.

After this step, we can use the random numbers which we create to predict the sales revenue from 2014 to 2018 as independent variables by using Formula ( 2.26 ).

From formula (2.25), we can get the value of α in Formula ( 2.24 ). And it can be used to calculate formula (2.25). In this case, we need to estimate the mean values and stand deviations for the logarithmic returns respectively.

Table 4.6 Mean values and standard deviations

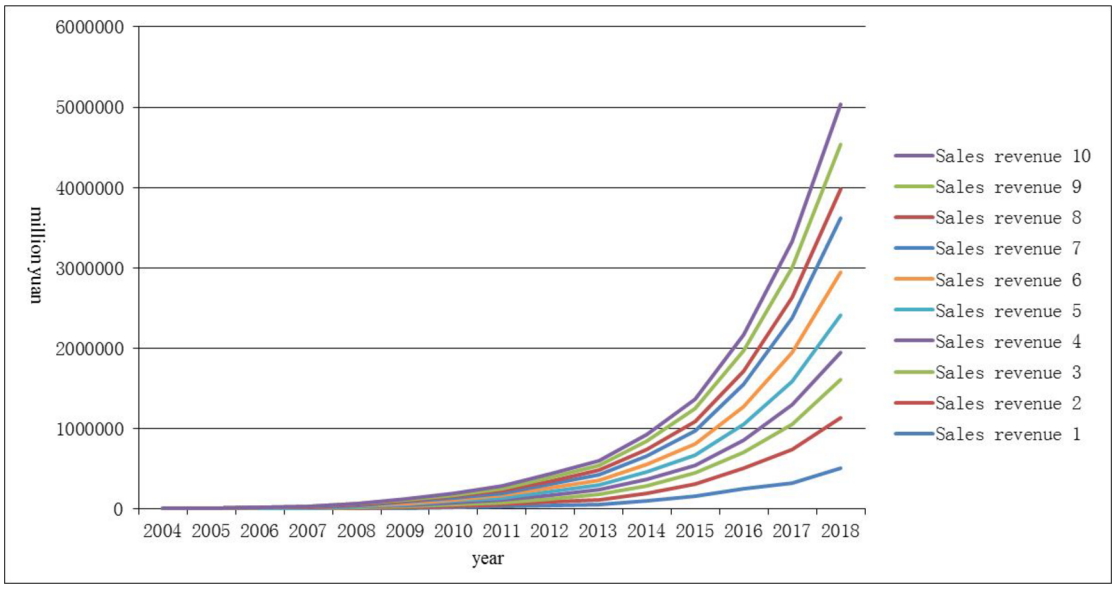
| | log R (Population) | Log R (Average wage) |
|---|---|---|
| 2005 | 0.005890852 | 0.107703443 |
| 2006 | 0.005278345 | 0.113953056 |
| 2007 | 0.005167382 | 0.158977652 |
| 2008 | 0.005080579 | 0.135154934 |
| 2009 | 0.004867579 | 0.084643359 |
| 2010 | 0.004791798 | 0.10674299 |
| 2011 | 0.004791212 | 0.132179049 |
| 2012 | 0.004953016 | 0.118951043 |
| 2013 | 0.004921255 | 0.092862066 |
| mean | 0.005082447 | 0.116796399 |
| stdev | 0.000326141 | 0.021489197 |

From table (4.6), we can estimate the mean value and standard deviation for the logarithmic return of *Population* and *Average wage*. Until 2009 Tencent company was a new and developing company so that the wage of the employees in the company was unstable and there was a high volatility and a big difference among the employees' average wage in different years. But the average wage of employees in Tencent company are becoming more and more stable since 2009. According to the real situation, we will only collect the data after 2009 to calculate the mean value and

standard deviation for the logarithmic return. In this way, the result will be closer to the recent situation.

After estimating the mean value and the standard deviation of the logarithmic return for the population and average wage, we can use formula (2.26) to estimate the evolution of independent variables evaluations for the 10,000 scenarios. Hence, we put the independent variables into Formula (4.1), and we will have 10,000 sales revenues for the next 5 business years. Hence, we can choose 10 scenarios randomly from the the 10,000 cases and describe them as follows,

Chart 4.1 Ten sample scenarios of sales revenues prediction




In image (4.6), there are 10 scenarios which we choose randomly from the the 10,000 cases. From image (4.6), the sales revenue of Tencent company which we predict from 2014 to 2018 may increase at different degree under the different kinds of risk conditions. On the one hand, its sales revenue can continue increasing quickly as the historical years. On the other hand, the fast development in the historical years maybe accumulate some problems which can lead to a financial crisis for Tencent company. Overall, the trend of the sales revenue's development is increasing without any big fluctuations.

## 4.2 Financial plan

Financial plan plays an important role in the company's prediction. In this part, there are 4 financial plans: Plan of earnings before interest and tax, Plan of net working capital, Plan of investments and Plan of deprecation.

**Plan of earning before interest and tax ( EBIT )**

Firstly, we should calculate the historical data to get the result of operating margin for 2004 to 2013.

Table 4.7 Historical operating margin for Tencent company

| year | operating margin |
|---|---|
| 2004 | 40.99% |
| 2005 | 33.96% |
| 2006 | 41.54% |
| 2007 | 42.79% |
| 2008 | 45.37% |
| 2009 | 48.40% |
| 2010 | 50.08% |
| 2011 | 43% |
| 2012 | 35.26% |

From table (4.7), there are historical data for operating margins from 2004 to 2013. Overall, the operating margins are stable with some few fluctuations between 30% to 51%. Generally we believe that the year is more closer to the predictive years, the influence of the years should be bigger. So we assume different weights to the operating margins for different years, higher weights for latest years, lower weights to the years before. And the sum of weights of the ten years we assume as 1, that means the years before 2004 we don't take into the consideration for the prediction cause they are too far from the predictive years to have the influence on the prediction.

Table 4.8 Operating margin with weight

| year | operating margin | weight |
|---|---|---|
| 2004 | 40.99% | 0.025 |
| 2005 | 33.96% | 0.025 |
| 2006 | 41.54% | 0.025 |
| 2007 | 42.79% | 0.025 |
| 2008 | 45.37% | 0.05 |
| 2009 | 48.40% | 0.1 |
| 2010 | 50.08% | 0.15 |
| 2011 | 43% | 0.25 |
| 2012 | 35.26% | 0.35 |
| sum | | 1 |

We can use formula (2.3) to compute the weighted average operating margins from historical data, which equals to *0.416935*.

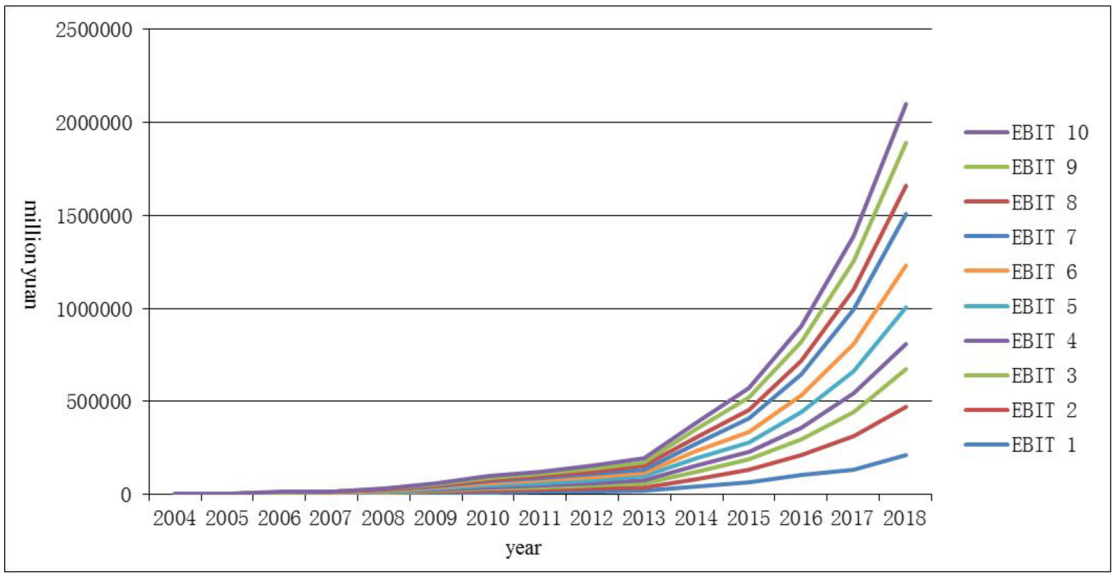
$$k = \sum_{i=1}^{t} k_i \cdot w_i = 0.416935 \tag{4.2}$$

Because we have already estimated 1000 scenarios for future 5 business years of sales revenues, so that we can continue to calculate EBIT with the 1000 scenarios of sales revenues. Then we can estimate 1000 scenarios of EBIT. Finally, we can pick 10 scenarios of them randomly to predict the trend of development fro EBIT into next 5 years.

Table 4.9 Plan of EBIT

| | | | | | Million yuan |
|---|---|---|---|---|---|
| | 2014 | 2015 | 2016 | 2017 | 2018 |
| EBIT 1 | 41467.97 | 66628.95 | 105372.61 | 134854.59 | 213100.13 |
| EBIT 2 | 42317.48 | 64854.52 | 105625.65 | 175164.64 | 258843.24 |
| EBIT 3 | 38051.20 | 54902.50 | 85736.16 | 130905.66 | 199349.89 |
| EBIT 4 | 33105.44 | 42541.78 | 62519.90 | 102745.43 | 138869.19 |
| EBIT 5 | 39296.00 | 51019.57 | 80892.86 | 119624.88 | 195066.87 |
| EBIT 6 | 38761.93 | 56682.55 | 91321.70 | 146867.51 | 225445.56 |
| EBIT 7 | 41083.43 | 70650.25 | 114537.55 | 181900.18 | 279082.76 |
| EBIT 8 | 34960.11 | 48194.65 | 70454.88 | 108225.66 | 148664.61 |
| EBIT 9 | 42703.73 | 64684.76 | 105830.14 | 152604.20 | 235192.19 |
| EBIT 10 | 36922.99 | 50616.64 | 80950.43 | 137703.22 | 203923.90 |

Chart 4.2 Plan of EBIT




Where in chart (4.2), we pick up 10 scenarios from the 1000 scenarios randomly, then we can get the trend above for the Tencent's development in next 5 years. Because of the good development of the sales revenue in the latest years, EBIT prediction may not have a big fluctuation in the next 6 year, either. On the one hand, its sales revenue can continue increasing quickly as the historical years. On the other hand, the fast development in the historical years maybe accumulate some problems which can lead to a financial crisis for Tencent company.

**Plan of net working capital**

The plan of net working capital can reveal the relationship between changes in the items of the net working capital and the volume of the productions. Working capital can be the inventory or the receivables. In order to do the plan of the net working capital in the future, we need calculate the growth rate for the current assets and current liabilities.

Table 4.10 Historical data for current assets and current liabilities

Million yuan

| year | Current Assets | Current liabilities | Growth rate for current assets | Growth rate for current liability | weight |
|---|---|---|---|---|---|
| 2004 | 1897 | 31 | - | - | - |
| 2005 | 1610 | 13 | -15.13% | -58.06% | 0.025 |
| 2006 | 1623 | 124 | 0.81% | 853.85% | 0.025 |
| 2007 | 2305 | 242 | 42.02% | 95.16% | 0.025 |
| 2008 | 1871 | 396 | -18.83% | 63.64% | 0.025 |
| 2009 | 1171 | 1131 | -37.41% | 185.61% | 0.025 |
| 2010 | 951 | 1890 | -18.79% | 67.11% | 0.075 |
| 2011 | 1452 | 1916 | 52.68% | 1.38% | 0.1 |
| 2012 | 5097 | 2353 | 251.03% | 22.81% | 0.2 |
| 2013 | 5394 | 2690 | 5.83% | 14.32% | 0.5 |

Where in table (4.10), we have calculated the historical growth rate for current assets and current liabilities. From the data we can see the growth rate for the historical currents and current liabilities have a big variance so that we can conclude that the current assets and current liabilities growth very unstable. Then we can use the weight methods which we have used in the EBIT prediction before. From this

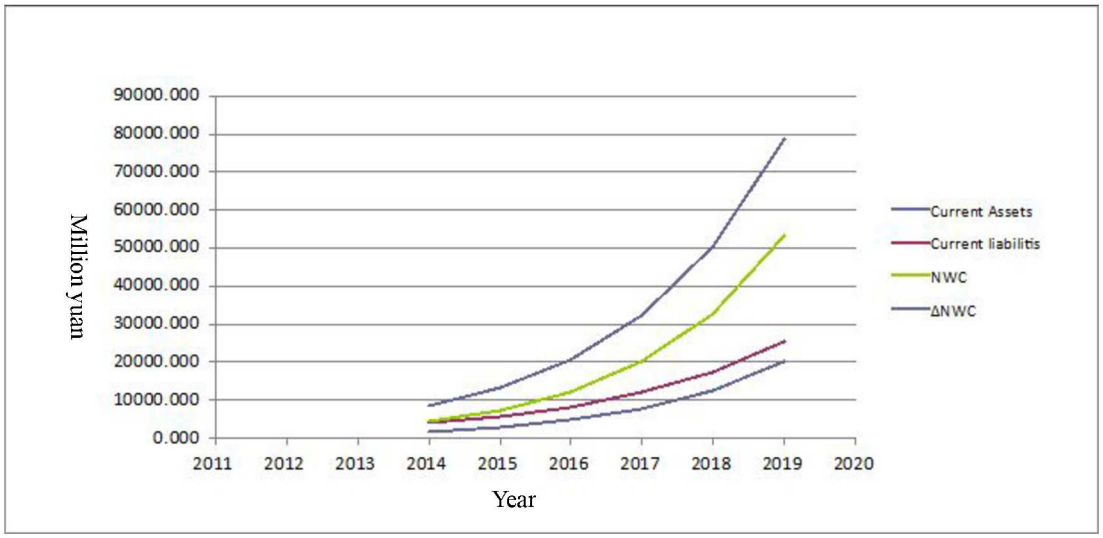
method we can get a result of weighted average growth rate which we can use for the plans of future current assets and future liabilities. From the weighted average method, we can calculate that the weighted average growth rate for current assets is 56.266% and the weighted average growth rate for current liabilities is 45.398%.

After getting result of the weighted average growth rate for current assets and current liabilities, we can continue to estimate the plan of net working capital (NWC) and changes in the net working capital (ΔNWC) as following,

Table 4.11 Estimation of NWC and ΔNWC

| | | | | MIllion yuan |
|---|---|---|---|---|
| year | Current Assets | Current liabilitis | NWC | ΔNWC |
| 2014 | 8428.967 | 3911.207 | 4517.761 | 1813.761 |
| 2015 | 13171.577 | 5686.817 | 7484.761 | 2967.000 |
| 2016 | 20582.646 | 8268.519 | 12314.128 | 4829.367 |
| 2017 | 32163.598 | 12022.262 | 20141.336 | 7827.209 |
| 2018 | 50260.644 | 17480.130 | 32780.514 | 12639.178 |
| 2019 | 78540.104 | 25415.762 | 53124.342 | 20343.828 |

Chart 4.3 Plan of Net working capital



**Plan of investment**

To plan of investment, we should find the historical investment value firstly as following,

Table 4.12 Historical data of Tencent's investment

| | | | | | | | | | | Million yuan |
|---|---|---|---|---|---|---|---|---|---|---|
| year | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 |
| Investment | 91 | 225 | 635 | 1001 | 1009 | 1449 | 1027 | 3689 | 4493 | 5799 |

From table (4.12), we can see the historical investment of Tencent company from 2004 to 2013. In this period, the investment increased significantly in several years. Then we can calculate the growth rate of the investment among these years. After that we can use the weighted average method to estimate the growth rate of the investment in the future years.

Table 4.13 Estimation of growth rate and weighted average application

| | | | Million yuan |
|---|---|---|---|
| year | Investment | Growth rate for Investment | weight |
| 2004 | 91 | | |
| 2005 | 225 | 147.3% | 2.5% |
| 2006 | 635 | 182.2% | 2.5% |
| 2007 | 1001 | 57.6% | 2.5% |
| 2008 | 1009 | 0.8% | 2.5% |
| 2009 | 1449 | 43.6% | 2.5% |
| 2010 | 1027 | -29.1% | 7.5% |
| 2011 | 3689 | 259.2% | 10.0% |
| 2012 | 4493 | 21.8% | 20.0% |
| 2013 | 5799 | 29.1% | 50.0% |
| sum | | | 1 |
| Weighted average | | | 5.935% |

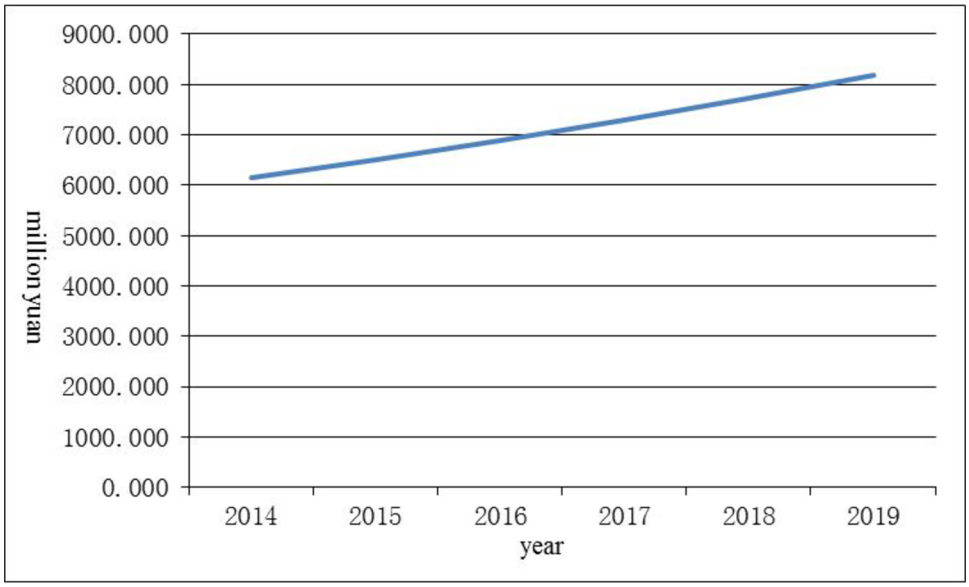
Where in table (4.13), we can see the investment of Tencent company increased dramatically with one fluctuation in the historical. But the whole trend of the

investment is increasing. After 2012, the growth of the investment becomes more and more stable. We assume the investment will grow much more stable in the future and use the weighted average method to get the result of weighted average growth rate is 5.935%. Then we can estimate the investment in the future as following,

Table 4.14 Plan of Investment

| | Million yuan |
|---|---|
| year | Investment |
| 2014 | 6143.180 |
| 2015 | 6507.788 |
| 2016 | 6894.036 |
| 2017 | 7303.209 |
| 2018 | 7736.667 |
| 2019 | 8195.851 |

Chart 4.4 Plan of investment




Where in Chart (4.4), we can see that the investment of the Tencent company will be planned to grow stably from 6000 to 8200 million yuan approximately into next 6 years.

**Plan of deprecation**

The main approach for the plan of the depreciation is investment approach which requires that depreciation should be smaller than investment. Because if the depreciation is higher than investment, several years later, the company won't have fixed assets, and can't afford any operating activities,which leads to company bankrupt. So let depreciation higher than investment is necessary.

Table 4.15 Historical depreciation and growth rate for depreciation

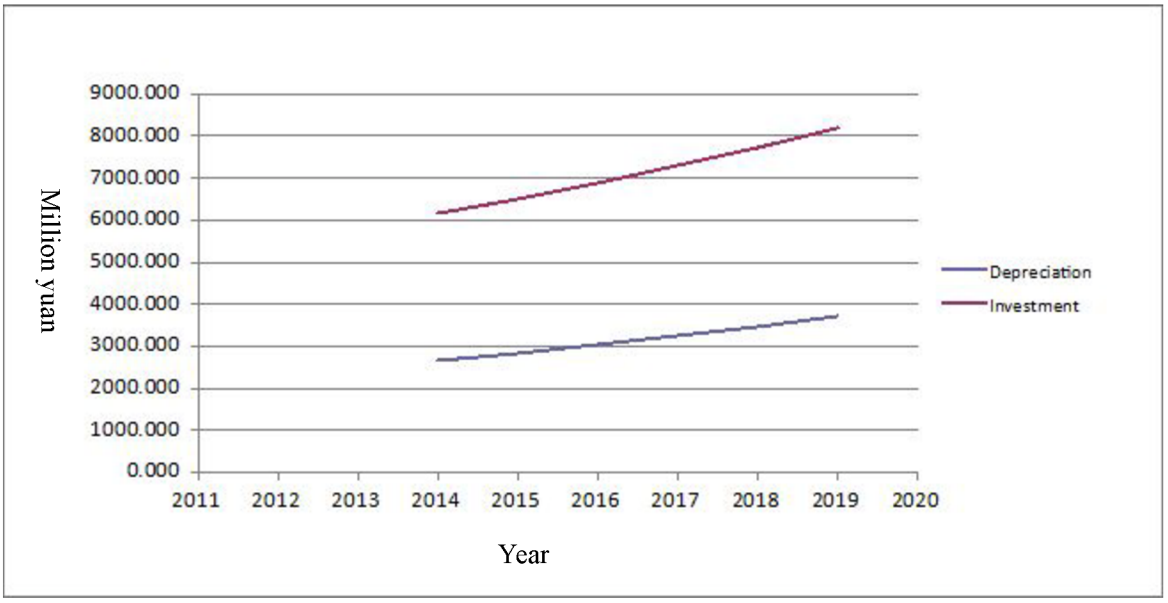
| | | | Million yuan |
|---|---|---|---|
| year | Depreciation | Growth rate for Depreciation | weight |
| 2004 | 28 | | |
| 2005 | 55 | 96.43% | 2.5% |
| 2006 | 106 | 92.73% | 2.5% |
| 2007 | 147 | 38.68% | 2.5% |
| 2008 | 105 | -28.57% | 2.5% |
| 2009 | 174 | 65.71% | 2.5% |
| 2010 | 446 | 156.32% | 7.5% |
| 2011 | 1208 | 170.85% | 10.0% |
| 2012 | 1880 | 55.63% | 20.0% |
| 2013 | 2484 | 32.13% | 50.0% |
| Weighted average | | | 0.069581607 |

Where in table (4.15), we can see the depreciation of Tencent company increased quickly with only one fluctuation in 2008 which may be caused by global financial crisis. But the whole trend of the investment is increasing. After 2012, the growth of the depreciation becomes more and more stable. We assume the depreciation will grow much more stable in the future and use the weighted average method to get the result of weighted average growth rate is 6.958%. Then we can estimate the depreciation in the future as following,

Table 4.16 Plan of depreciation of Tencent company

| | | Million yuan |
|---|---|---|
| year | Depreciation | Investment |
| 2014 | 2656.841 | 6143.180 |
| 2015 | 2841.708 | 6507.788 |
| 2016 | 3039.439 | 6894.036 |
| 2017 | 3250.928 | 7303.209 |
| 2018 | 3477.132 | 7736.667 |
| 2019 | 3719.077 | 8195.851 |

Chart 4.5 Plan of depreciation




**Estimating of tax rate**

According to the Tencent company's annual report from 2004 to 2013, we can find the tax rate as following,

Table 4.17 Historical tax rate for Tencent company

| year | 2009 | 2010 | 2011 | 2012 | 2013 |
|---|---|---|---|---|---|
| tax rate | 20% | 22% | 24% | 25% | 25% |

According to table (4.17), we can see the tax rate increasing from 2009 to 2011 and continue to be 25% after 2012. Before 2012, the Tencent company enjoyed the chinese policy which was used to protect the new companies' development for ten years. After 2012, Tencent cannot enjoy the policy and the tax rate should be the 25% in legal. So that Tencent company's tax rate should be 25% continuously into next 6 years. Due to this reason, we will use 25% as the tax rate to estimate the free cash flow to Tencent company into next 6 years.

**Expected random FCFF evaluation**

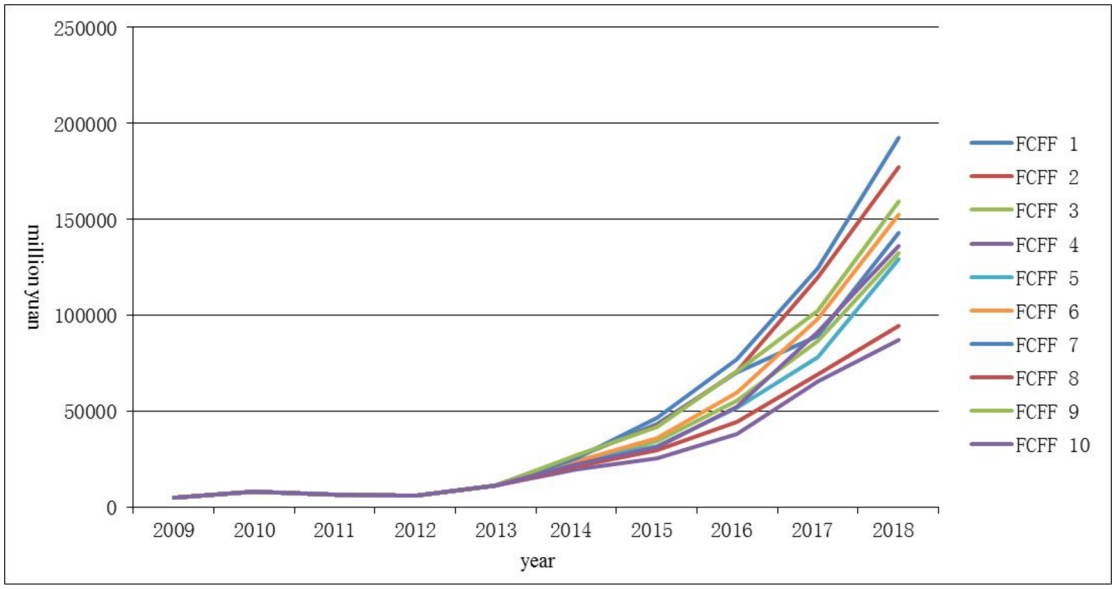
Because we have already estimate EBIT, tax rate, depreciation, investment and changes in net working capital ( ΔNWC ) before, we can estimate free cash flow to firm ( FCFF ) directly by using formula (2.10).

Table 4.16 Data for estimation of FCFF

| | | | | Million yuan |
|---|---|---|---|---|
| year | Depreciation | Investment | ΔNWC | tax rate |
| 2014 | 2656.841 | 6143.180 | 1813.761 | 25% |
| 2015 | 2841.708 | 6507.788 | 2967.000 | 25% |
| 2016 | 3039.439 | 6894.036 | 4829.367 | 25% |
| 2017 | 3250.928 | 7303.209 | 7827.209 | 25% |
| 2018 | 3477.132 | 7736.667 | 12639.178 | 25% |
| 2019 | 3719.077 | 8195.851 | 20343.828 | 25% |

Because we have estimated 1000 scenarios of EBIT before, so we can use these value to predict 1000 scenarios of FCFF. Through formula (2.10), we can estimate the value of FCFF. And we will choose 10 of scenarios randomly to make a graph.

Chart 4.5 Prediction of FCFF




Where in chart (4.5), there are different possibilities of development of FCFF according to the different risk.

## 4.3 Cost of capital calculation

In order to calculate the cost of capital, we can use Formula ( 2.13 ) to estimate the weighted average cost of capital. In this formula, the value of FCFF we have already estimated before, now we should estimate the cost of equity and cost of debt.

### 4.3.1 Weights of equity and debt

Generally speaking, a company's assets are financed by debt and equity. We need to calculate the weight of equity and the weight of debt. In the procedure of the calculation, we need use the market value. The market value of equity (E) is also called "Market Cap". As of today, Tencent Holdings Ltd's market capitalization (E) is $169172.800 million yuan. The calculation is as following,

weight of equity = E / (E + D)

= 169172.800 / (169172.800 + 2097.46868413)

= 0.9878 (4.3)

weight of debt = D / (E + D)

= 2097.46868413 / (169172.800 + 2097.46868413)

= 0.0122 (4.4)

Where in formula (4.3) and formula (4.4), *D* is the market value of debt and *E* is the market value of equity.

### 4.3.2 Cost of equity

Cost of equity is one of the important part to calculate weighted average cost of capital. We can use capital assets pricing model (CAPM) to calculate cost of capital. In order to calculate cost of capital, we need find risk free rate, β coefficient and risk premium according to formula (2.14).

Firstly, we can find the risk free rate in Tencent annual report as following,

Table 4.17 Risk free rate for Tencent company

| year | 2009 | 2010 | 2011 | 2012 | 2013 |
|---|---|---|---|---|---|
| Risk free rate | 0.71% | 0.63% | 1.35% - 2.31% | 0.40% | 1.65% - 1.91% |

After we average the risk free rate, we can estimate the risk free rate for the short-term is equal to 1.07%. And the risk free rate for the Ten years treasury constant maturity is 1.92%.

$$R_{(f1)} = 1.07\% \qquad R_{(f2)} = 1.92\%$$

Beta ($\beta$) is the sensitivity of the expected excess asset returns to the expected excess market returns. Tencent Holdings Ltd's beta is 1.01.

Risk premium is the distance between expected return of the market and risk-free rate of return. Tencent's risk premium is required to be 7.5%.

$$E(R_e)_1 = 1.07\% + 1.01 \cdot 7.5\% = 8.645\% \quad (4.5)$$

$$E(R_e)_2 = 1.92\% + 1.01 \cdot 7.5\% = 9.495\% \quad (4.6)$$

### 4.3.3 Cost of debt

To calculate cost of debt, here we use Tencnet's last fiscal year end Interest Expense divided by the latest two-year average debt to get the simplified cost of debt. As of December of 2013, Tencent Holdings Ltd's interest expense (positive number) was $64.8666447152 million yuan. Its total Book Value of Debt (D) is $2097.46868413 million yuan. So we can calculate cost of debt as following,

$$\text{Cost of Debt} = 64.8666447152 / 2097.46868413 = 3.0926\% \quad (4.7)$$

### 4.3.4 Cost of capital

We will use the Weighted Average Cost of Capital (WACC) method to calculate the cost of capital which will be used in the calculation of FCF. We can input data in t formula (2.13), then we can get the results as following,

$$WACC_1=0.9878*0.086+0.0122*0.0309*0.75=0.85233 \quad (4.8)$$

$$WACC_2=0.9878*0.095+0.0122*0.0309*0.75=0.94133 \quad (4.9)$$

From the calculations above, we can get the result of WACC1 is 85.23% and WACC2 is 94.13%.

## 4.4 Estimation of probability distribution

In this part, we will do the estimation of valuation for Tencent company by using the data which we collect from the finance sheet of Tencent company and calculate them in the chapter 4. To estimate the market value of Tencent company, we choose to use the Discount cash flow (DCF) method which we mention in the chapter 2.

By using DCF method to calculate the market value of Tencent company, we need to divided the development of Tencent company into two phases. In this thesis, we regard the year from 2014 to 2017 as the first phase and the second phase is from 2017 to infinite.

We can calculate the market value of Tencent company under 10,000 different risk conditions according to formula (2.8). In the first phase, we can calculate 10,000 values with the 10,000 FCFF we have. In the second phase, we need to estimate the growth rate. Because the market premium is 7.5%, the cost of capital is 9.412% and the growth rate should be smaller than the required market premium so that we assume the growth rate is 7.41%. Hence, we can continue to estimate the 10,000 values with 10,000 FCFF according to formula (2.8). Then we can calculate 10,000 market values of Tencent company by summing the values in the first phase and the second phase under each case.

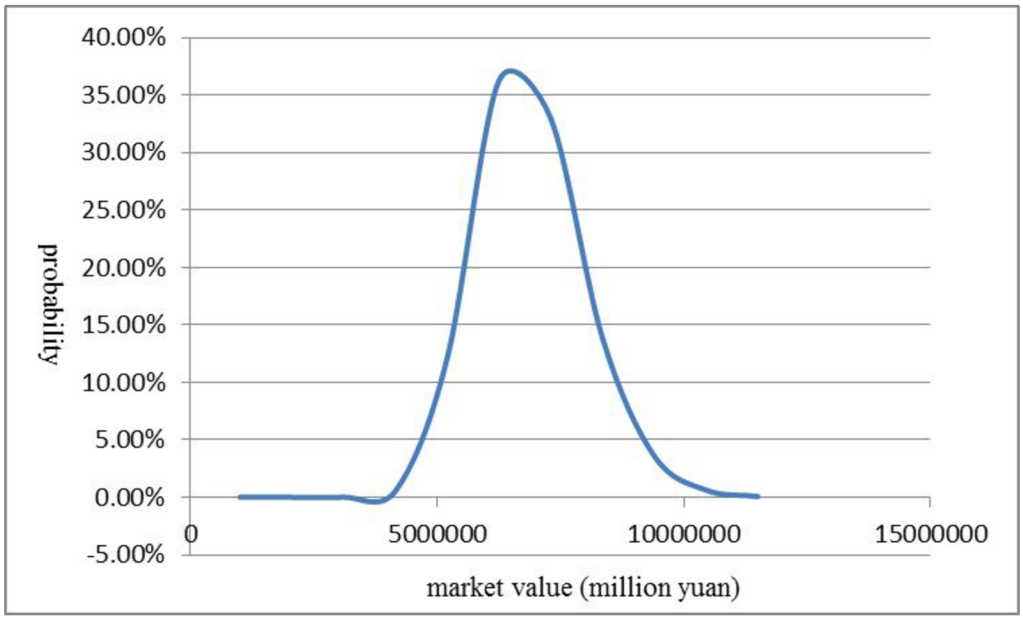
After working out the 10,000 market values of Tencent company, we can make the probability distribution for the market values. First of all, we can use Excel function *Max* and *Min* to find the maximum and minimal values respectively among the 10,000 market values of Tencent company, then we can divide the values into 10 intervals

and with the intervals and find the frequency for each one. Hence, we can do the probability distribution for the 10,000 market values of Tencent company.

Table 4.18 Valuation frequency

| 10 interval Markte value | interval frequency | probability |
|---|---|---|
| 1000000 | 0 | 0.00% |
| 2050000 | 1 | 0.01% |
| 3100000 | 54 | 0.54% |
| 4150000 | 1207 | 12.07% |
| 5200000 | 3624 | 36.24% |
| 6250000 | 3298 | 32.98% |
| 7300000 | 1385 | 13.85% |
| 8350000 | 359 | 3.59% |
| 9400000 | 63 | 0.63% |
| 10450000 | 7 | 0.07% |
| 11500000 | 2 | 0.02% |
| total | 10000 | 1 |

Chart 4.6 Probability distribution




From chart (4.6), we can see the 10,000 market values which we estimate for Tencent company performance as the normal distribution that display between 0 and 1. The market values of Tencent company display to the infinite. According to table

(4.18), the most frequency interval is the value between 5,200,000 and 6,250,000 million yuan. Hence, we can calculate the mean market value between 5,200,000 and 6,250,000 million yuan. The result is 4,675,000 million yuan. So the market value which we estimate for Tencent company is 4,675,000 million yuan which is equal to 4,675 billion yuan. Compare the book value which we can find is 183.29 billion dollar ( According to the exchange rate that is 1USD=6.2 yuan, the book value of Tencent company is 1136 billion yuan ), the market value is much more bigger than the book value which means the market overrated Tencent company. Here, we can use Percentile method to analysis this case as follows,

Table 4.19 Information about value distribution of Tencent company

| billion yuan | |
|---|---|
| Market value | 6732 |
| Std (V) | 1054 |
| max market value | 10671 |
| min market value | 1917 |
| percentile 10% | 4043 |
| percentile 5% | 3770 |
| percentile1% | 3294 |
| percentile 0.01% | 2267 |

From table (4.19), we can see that the market value of Tencent company which we estimate is 4675 billion yuan, the standard deviation of the 10,000 market value is 1054, the maximum market value of Tencent company in the probability distribution is 10,671 billion yuan and the minimum market value of Tencent company in the probability distribution is 1,917 billion yuan. And in Percentile method, at the percentile 10% level, the expected value is 4,043 billion yuan, which means there is 90% of chance that Tencent value will be greater than 4,043 billion yuan. There are the same ways for the explanations of the percentile 5% and percentile 1%. In addition , we can tell that there is the chance of 99.99% that Tencent`s value will be

greater than 2,267 billion yuan at the level of 0.01%. Overall, we can conclude that Tencent company have a good development.

## 4.5 Sensitivity analysis

In this part, we do the sensitivity analysis to test the changes in the Tencent market values which we valuated. In the sensitivity analysis, we assume the growth rate of Tencent company in the second phase as the uncertain indicator and other factors unchanged.

The growth rate of Tencent company we computed is 7.41%, so we can create the changes around 7.41%. Due to different growth rate of Tencent company, we can estimate different 10000 scenarios of valuations. Hence, we can estimate the different probability distribution of market value of Tencent company to valuate the market value of the company. The market values we valuate is as following,

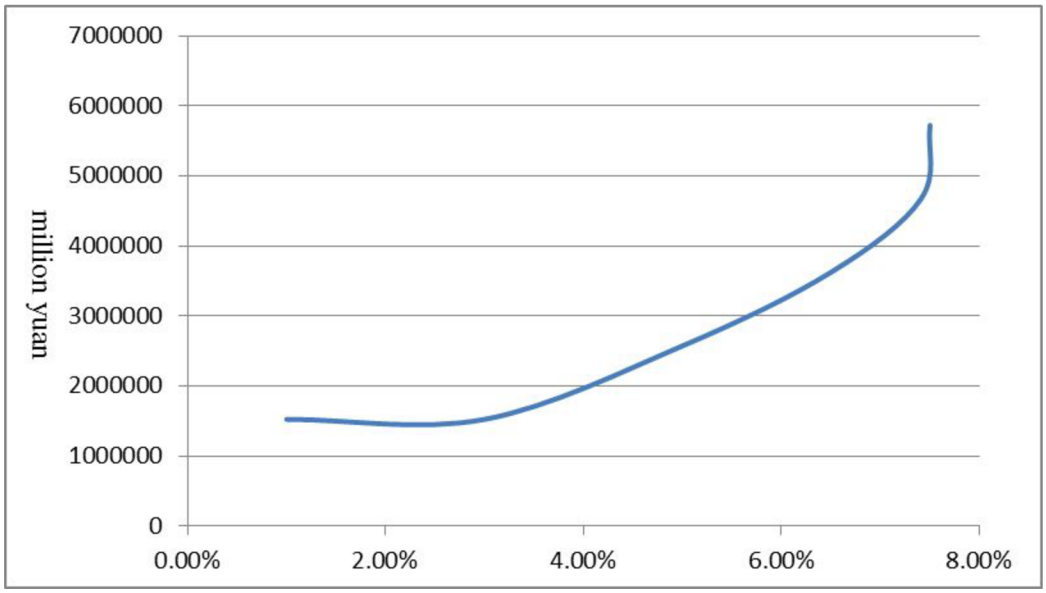
Table 4.20 Expected market value with different growth rates

| | | | | | | million yuan |
|---|---|---|---|---|---|---|
| Growth rate | 1.00% | 3.00% | 5.00% | 6.50% | 7.41% | 7.50% |
| Expected market value | 1525000 | 1525000 | 2575000 | 3625000 | 4675000 | 5725000 |

From table (4.20), we create the different growth rate which are range from 1% to 7.5%. With different growth rate, the market values of Tencent company we estimate are different from 1525000 to 5725000 million yuan. The graph for the valuations with different growth rates is as following,

.

Chart 4.7 Expected market value with different growth rates




From chart (4.7), we can see the relationship between the expected market value of Tencent company and growth rate. The higher the growth rate, the higher the expected market value of Tencent company.

After find the influence which the changes of the growth rate have on the expected market value of Tencent company, we can compare the probability distribution of Tencent market value at a fixed level of growth rate. Because the original growth rate is 7.41% and the market premium is 7.5%, the growth rate of Tencent company almost reach the upper limit. So we assume that growth rate of Tencent market value will have a decrease trend. We can decrease the growth rate of Tencent company 30% and 50% respectively as an example.

Decrease by 30%:

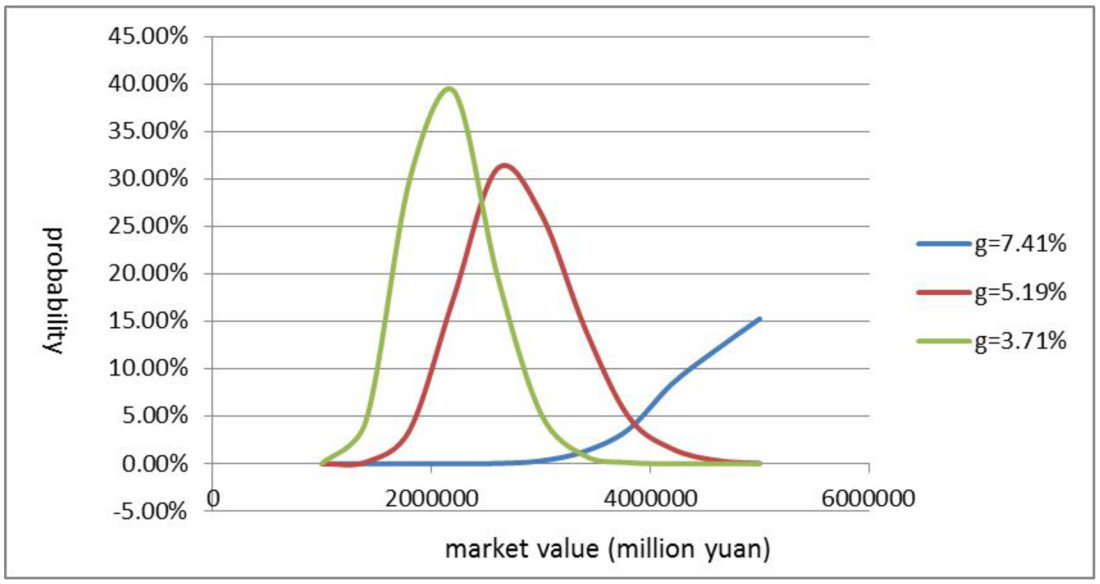
$$g_1 = g \cdot (1 - 30\%) = 5.19\%$$

Decrease by 50%:

$$g_2 = g \cdot (1 - 50\%) = 3.71\%$$

With the different growth rate we can create three probability distributions into one graph as following,

Chart 4.8 Probability distributions with different growth rates




From chart (4.8), we can see the three probability distribution of market value of Tencent company according to the different growth rates. From the distribution we can see that the lower growth rate of Tencent company, the more possibility that the expected market value of the Tencent company will be lower. According to the volatility, when the growth rate of Tencent company is lower, the risk of the expected market value will be less.

# 5. CONCLUSION

Tencent was founded in November 1998 and is one of China's largest Internet service providers. Its service user is also the largest amount in Chinese Internet companies.In macroeconomic analysis, china GDP growth rate is slower than before, but still keeps a quick speed. As an internet company, Tencent follows the step. Although the inflation is a little higher, totally the macroeconomic provides a good growing environment. China government also try to overcome the bad effect on macroeconomic by a series of policy.

In the second chapter, we introduce some method we will use for calculation into chapter 2. Here we introduce the methods for valuation, cost of equity, cost of debt, FCF and sales revenue prediction. the In order to estimate the value of Tencent company, we choose to use 2-stage DCF method to valuate Tencent company. To estimate the sales revenue, we make regression function for sales revenues by using Vasicek method, and we do the parameter estimation of Vasicek model bye LSM. After that we use Monte Carlo simulation and Cholesky decomposition to create 10000 kinds of scenarios of random numbers for the different risks of the sales evolution in the future and we can do the sale revenue prediction. Then we can make financial plans for Tencent company, including plan of earning before interest and tax, plan of investment, plan of net working capital and plan of depreciation. At last, we introduce the method to calculate the WACC and DCF for Tencent company.

In chapter 3, there are some basic information of Tencent company. Firstly, there is an overview of Tencent company in Social Networking Services Industry. Then we introduce the competitors for Tencent Company in this industry of chinese market. Hence we explain the structure of Tencent business profit and use SWOT method to anaysis the strength, weakness, opportunities and threats for Tencent company. At last we can see the business strategies of Tencent company. From this part, we can get the information that

Tencent is a high development of new company. The quick development brings Tencent great profit and big risk as well.

In chapter 4 , Tencent had a nice performance in the historical although there are few fluctuation, the situation is just temporary. For long term the sales revenue and FCFF have a big increase. The big variance of this ratios means that more profit need more challenge. In the historical years, government gave Tencemt a lot of help. But from 2013, Tencent should stand by itself. If Tencent cannot face with the big potential risks, it will have a big loss. At last we create the probability distribution of market value of Tencent company and we estimate the market value of Tencent company is 4,675,000 million yuan which is much more bigger than its book value 1,136,000 million yuan. The market value of Tencent company we estimated is a huge amount. It reflects that Tencent stand on the top of this sector.

Overall, Tencent gerw up tp the largest social net service company into China means it may have a great potential development and face a lot of big risks as well in the future.

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# List of Abbreviations

GDP Growth Domestic Product

CPI Consumer Price Index

EBIT Earnings before Interest and Taxes

EBT Earnings before Taxes EAT Earnings after Taxes

ROA Return on Assets

ROE Return on Equity

DCF Discount Casg Flow

NOPAT Net Operating Profit after Taxes

NWC Net Working Capital

WACC Weight average cost of capital

FCFF Free Cash Flow of Firm

RONIC Return on New Investment Capital

IR Investment rate

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Herewith I declare that

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Ostrava dated 26.06.2025

.....

Student's name and surname

# List of Annexes

1. Income statements of Tencent company from 2004 to 2013.
2. Balance sheet of Tencent company from 2004 to 2013.

# Annex 1

Income statements of Tencent company from 2004 to 2013

| | Note | For the year ended 31 December 2005 RMB'000 | 2004 RMB'000 (Restated) |
|---|---|---|---|
| **Revenues** | | | |
| Internet value-added services | | **786,680** | 439,041 |
| Mobile and telecommunications value-added services | | **517,265** | 641,190 |
| Online advertising | | **112,826** | 54,801 |
| Others | | **9,624** | 8,501 |
| | | **1,426,395** | 1,143,533 |
| Cost of revenues | 23, 25 | **(469,869)** | (418,125) |
| **Gross profit** | | **956,526** | 725,408 |
| Other gains, net | 24 | **73,145** | 25,915 |
| Selling and marketing expenses | 25 | **(197,627)** | (109,517) |
| General and administrative expenses | 25 | **(347,685)** | (173,110) |
| **Operating profit** | | **484,359** | 468,696 |
| Finance costs | 29 | **(47,304)** | (5,043) |
| **Profit before income tax** | | **437,055** | 463,653 |
| Income tax benefit/(expenses) | 30(a) | **48,307** | (22,534) |
| **Profit for the year** | | **485,362** | 441,119 |
| Earnings per share for profit attributable to the equity holders of the Company during the year (expressed in RMB per share) | | | |
| - basic | 31 | **0.274** | 0.290 |
| - diluted | 31 | **0.267** | 0.284 |

| | Note | Year ended 31 December 2007 RMB'000 | 2006 RMB'000 |
|---|---|---|---|
| **Revenues** | | | |
| Internet value-added services | | 2,513,728 | 1,825,343 |
| Mobile and telecommunications value-added services | | 807,645 | 700,114 |
| Online advertising | | 493,018 | 266,684 |
| Others | | 6,532 | 8,300 |
| | | 3,820,923 | 2,800,441 |
| Cost of revenues | 29, 31 | (1,117,557) | (817,062) |
| **Gross profit** | | 2,703,366 | 1,983,379 |
| Other gains, net | 30 | 69,212 | 83,195 |
| Selling and marketing expenses | 31 | (297,439) | (293,247) |
| General and administrative expenses | 31 | (840,113) | (610,022) |
| **Operating profit** | | 1,635,026 | 1,163,305 |
| Finance costs | 35 | (100,192) | (46,534) |
| Share of loss of a jointly controlled entity | | (331) | – |
| **Profit before income tax** | | 1,534,503 | 1,116,771 |
| Income tax benefit/(expense) | 36(a) | 33,505 | (52,971) |
| **Profit for the year** | | 1,568,008 | 1,063,800 |
| **Attributable to:** | | | |
| Equity holders of the Company | | 1,566,020 | 1,063,800 |
| Minority interests | | 1,988 | – |
| | | 1,568,008 | 1,063,800 |
| **Earnings per share for profit attributable to equity holders of the Company during the year** (expressed in RMB per share) | | | |
| – basic | 37(a) | 0.880 | 0.603 |
| – diluted | 37(b) | 0.853 | 0.585 |
| Dividends | 38 | HKD0.16 per share | HKD0.12 per share |

| | Note | Year ended 31 December 2009 RMB'000 | 2008 RMB'000 |
|---|---|---|---|
| **Revenues** | | | |
| Internet value-added services | | **9,530,711** | 4,914,974 |
| Mobile and telecommunications value-added services | | **1,905,599** | 1,398,984 |
| Online advertising | | **962,171** | 826,049 |
| Others | | **41,479** | 14,537 |
| | 5 | **12,439,960** | 7,154,544 |
| Cost of revenues | 29, 32 | **(3,889,468)** | (2,170,421) |
| **Gross profit** | | **8,550,492** | 4,984,123 |
| Interest income | 30 | **136,014** | 105,216 |
| Other (losses)/gains, net | 31 | **(58,213)** | 6,989 |
| Selling and marketing expenses | 32 | **(581,468)** | (518,147) |
| General and administrative expenses | 32 | **(2,026,347)** | (1,332,207) |
| **Operating profit** | | **6,020,478** | 3,245,974 |
| Finance costs | 36 | **(1,953)** | (140,732) |
| Share of profit/(loss) of associates | | **22,206** | (347) |
| **Profit before income tax** | | **6,040,731** | 3,104,895 |
| Income tax expense | 37(a) | **(819,120)** | (289,245) |
| **Profit for the year/total comprehensive income for the year** | | **5,221,611** | 2,815,650 |
| **Attributable to:** | | | |
| Equity holders of the Company | | **5,155,646** | 2,784,577 |
| Minority interests | | **65,965** | 31,073 |
| | | **5,221,611** | 2,815,650 |
| **Earnings per share for profit attributable to equity holders of the Company during the year (expressed in RMB per share)** | | | |
| – basic | 39(a) | **2.862** | 1.552 |
| – diluted | 39(b) | **2.791** | 1.514 |
| **Dividends per share** | | | |
| Final dividend proposed | 40 | **HKD0.40** | HKD0.25 |
| Special dividend proposed | 40 | **–** | HKD0.10 |
| | | **HKD0.40** | HKD0.35 |

| | Note | Year ended 31 December 2011 RMB'000 | 2010 RMB'000 |
|---|---|---|---|
| **Revenues** | | | |
| Internet value-added services | | **23,042,758** | 15,482,301 |
| Mobile and telecommunications value-added services | | **3,270,841** | 2,715,931 |
| Online advertising | | **1,992,216** | 1,372,522 |
| Others | | **190,257** | 75,277 |
| | 5 | **28,496,072** | 19,646,031 |
| Cost of revenues | 31, 34 | **(9,928,308)** | (6,320,200) |
| **Gross profit** | | **18,567,764** | 13,325,831 |
| Interest income | 32 | **468,990** | 255,922 |
| Other gains, net | 33 | **420,803** | 38,056 |
| Selling and marketing expenses | 34 | **(1,920,853)** | (945,370) |
| General and administrative expenses | 34 | **(5,283,154)** | (2,836,226) |
| **Operating profit** | | **12,253,550** | 9,838,213 |
| Finance income/(costs), net | 38 | **35,505** | (838) |
| Share of (losses)/profit of associates | | **(24,255)** | 72,359 |
| Share of (losses)/profit of jointly controlled entities | | **(165,731)** | 3,399 |
| **Profit before income tax** | | **12,099,069** | 9,913,133 |
| Income tax expense | 39(a) | **(1,874,238)** | (1,797,924) |
| **Profit for the year** | | **10,224,831** | 8,115,209 |
| **Attributable to:** | | | |
| Equity holders of the Company | | **10,203,083** | 8,053,625 |
| Non-controlling interests | | **21,748** | 61,584 |
| | | **10,224,831** | 8,115,209 |

| | Note | Year ended 31 December 2011 RMB'000 | 2010 RMB'000 |
|---|---|---|---|
| **Earnings per share for profit attributable to equity holders of the Company (expressed in RMB per share)** | | | |
| – basic | 41(a) | **5.609** | 4.432 |
| – diluted | 41(b) | **5.490** | 4.328 |
| **Dividend per share** | | | |
| Final dividend proposed | 42 | **HKD0.75** | HKD0.55 |

The notes on pages 86 to 188 are an integral part of these consolidated financial statements.

| | Note | Year ended 31 December 2013 RMB'Million | 2012 RMB'Million |
|---|---|---|---|
| **Revenues** | | | |
| Value-added services | | **44,985** | 35,718 |
| Online advertising | | **5,034** | 3,382 |
| eCommerce transactions | | **9,796** | 4,428 |
| Others | | **622** | 366 |
| | 5 | **60,437** | 43,894 |
| Cost of revenues | 29, 32 | **(27,778)** | (18,207) |
| **Gross profit** | | **32,659** | 25,687 |
| Interest income | 30 | **1,314** | 836 |
| Other gains/(losses), net | 31 | **904** | (284) |
| Selling and marketing expenses | 32 | **(5,695)** | (2,994) |
| General and administrative expenses | 32 | **(9,988)** | (7,766) |
| **Operating profit** | | **19,194** | 15,479 |
| Finance costs, net | 36 | **(84)** | (348) |
| Share of profit/(losses) of associates | | **213** | (54) |
| Share of losses of joint ventures | | **(42)** | (26) |
| **Profit before income tax** | | **19,281** | 15,051 |
| Income tax expense | 37(a) | **(3,718)** | (2,266) |
| **Profit for the year** | | **15,563** | 12,785 |
| **Attributable to:** | | | |
| Equity holders of the Company | | **15,502** | 12,732 |
| Non-controlling interests | | **61** | 53 |
| | | **15,563** | 12,785 |

| | Note | Year ended 31 December 2013 RMB'Million | 2012 RMB'Million |
|---|---|---|---|
| **Earnings per share for profit attributable to equity holders of the Company (in RMB per share)** | | | |
| – basic | 39(a) | **8.464** | 6.965 |
| – diluted | 39(b) | **8.298** | 6.833 |
| **Dividend per share** | | | |
| Final dividend proposed | 40 | **HKD1.20** | HKD1.00 |

# Annex 2

Balance sheet of Tencent company from 2004 to 2013

## BALANCE SHEET – THE COMPANY

As at 31 December 2005

| | Note | As at 31 December 2005 RMB'000 | 2004 RMB'000 (Restated) |
|---|---|---|---|
| **ASSETS** | | | |
| **Non-current assets** | | | |
| Fixed assets | | 549 | 1,161 |
| Intangible assets | | 32 | — |
| Investments in subsidiaries | 8(a) | 68,389 | 5,587 |
| | | 68,970 | 6,748 |
| **Current assets** | | | |
| Amounts due from subsidiaries | 8(b) | 1,523,735 | 1,816,302 |
| Prepayments, deposits and other receivables | | 3,314 | 1,770 |
| Term deposits with original maturities of over three months | 14 | 20,176 | 33,156 |
| Cash and cash equivalents | 15 | 62,356 | 46,059 |
| | | 1,609,581 | 1,897,287 |
| **Total assets** | | 1,678,551 | 1,904,035 |
| **EQUITY** | | | |
| **Shareholders' equity** | | | |
| Share capital | 16 | 192 | 192 |
| Share premium | 16 | 1,666,044 | 1,777,721 |
| Share-based compensation reserve | 16 | 40,109 | 5,583 |
| Other reserves | 17(b) | (16,534) | (16,534) |
| (Accumulated deficit)/retained earnings | | (24,114) | 106,212 |
| | | 1,665,697 | 1,873,174 |
| **LIABILITIES** | | | |
| **Current liabilities** | | | |
| Amounts due to subsidiaries | 8(b) | 10,662 | 24,793 |
| Other payables and accruals | | 2,192 | 5,923 |
| Dividends payable | | — | 145 |
| | | 12,854 | 30,861 |
| **Total equity and liabilities** | | 1,678,551 | 1,904,035 |

## BALANCE SHEET - THE COMPANY

As at 31 December 2007

| | Note | As at 31 December 2007 RMB'000 | 2006 RMB'000 |
|---|---|---|---|
| **ASSETS** | | | |
| **Non-current assets** | | | |
| Fixed assets | | 115 | 167 |
| Intangible assets | | 1,695 | 534 |
| Investments in subsidiaries | 11(a) | 248,529 | 146,361 |
| | | 250,339 | 147,062 |
| **Current assets** | | | |
| Amounts due from subsidiaries | 11(b) | 2,192,300 | 1,538,076 |
| Prepayments, deposits and other receivables | | 3,418 | 1,889 |
| Term deposits with initial term of over three months | 19 | – | 15,618 |
| Cash and cash equivalents | 20 | 109,449 | 67,394 |
| | | 2,305,167 | 1,622,977 |
| **Total assets** | | 2,555,506 | 1,770,039 |
| **EQUITY** | | | |
| **Equity attributable to the Company's equity holders** | | | |
| Share capital | 21 | 194 | 192 |
| Share premium | 21 | 1,455,854 | 1,459,020 |
| Share-based compensation reserve | 21 | 220,230 | 118,078 |
| Retained earnings | | 637,069 | 69,057 |
| | | 2,313,347 | 1,646,347 |
| **LIABILITIES** | | | |
| **Current liabilities** | | | |
| Amounts due to subsidiaries | 11(b) | 227,855 | 119,034 |
| Other payables and accruals | | 14,304 | 4,658 |
| | | 242,159 | 123,692 |
| **Total equity and liabilities** | | 2,555,506 | 1,770,039 |

# STATEMENT OF FINANCIAL POSITION - THE COMPANY

As at 31 December 2009

| | Note | As at 31 December 2009 RMB'000 | 2008 RMB'000 |
|---|---|---|---|
| **ASSETS** | | | |
| **Non-current assets** | | | |
| Fixed assets | | 445 | 80 |
| Intangible assets | | 3,245 | 3,798 |
| Investments in subsidiaries | 11(a) | 1,981,736 | 409,744 |
| Available-for-sale financial assets | | 14,758 | 9,840 |
| Contribution to Share Scheme Trust | 11(c) | 794 | 295 |
| Amounts due from subsidiaries | 11(b) | 341,410 | – |
| | | 2,342,388 | 423,757 |
| **Current assets** | | | |
| Amounts due from subsidiaries | 11(b) | 1,060,822 | 1,769,976 |
| Prepayments, deposits and other receivables | | 8,349 | 5,646 |
| Cash and cash equivalents | 19 | 102,081 | 95,957 |
| | | 1,171,252 | 1,871,579 |
| **Total assets** | | 3,513,640 | 2,295,336 |
| **EQUITY** | | | |
| **Equity attributable to the Company's equity holders** | | | |
| Share capital | 20 | 197 | 195 |
| Share premium | 20 | 1,244,425 | 1,155,209 |
| Shares held for share award scheme | 20 | (123,767) | (21,809) |
| Share-based compensation reserve | 20 | 703,563 | 381,439 |
| Retained earnings | | 557,521 | 383,888 |
| **Total equity** | | 2,381,939 | 1,898,922 |
| **LIABILITIES** | | | |
| **Current liabilities** | | | |
| Amounts due to subsidiaries | 11(b) | 1,107,184 | 374,114 |
| Other payables and accruals | | 24,517 | 22,300 |
| | | 1,131,701 | 396,414 |
| **Total equity and liabilities** | | 3,513,640 | 2,295,336 |
| **Net current assets** | | 39,551 | 1,475,165 |
| **Total assets less current liabilities** | | 2,381,939 | 1,898,922 |

## Statement of Financial Position - The Company

As at 31 December 2011

| | Note | As at 31 December 2011 RMB'000 | 2010 RMB'000 |
|---|---|---|---|
| **ASSETS** | | | |
| **Non-current assets** | | | |
| Fixed assets | | **243** | 342 |
| Intangible assets | | **4,958** | 4,809 |
| Investments in subsidiaries | 11(a) | **5,782,381** | 2,834,852 |
| Contribution to Share Scheme Trust | 11(c) | **896** | 287 |
| | | **5,788,478** | 2,840,290 |
| **Current assets** | | | |
| Amounts due from subsidiaries | | **1,260,180** | 708,074 |
| Prepayments, deposits and other receivables | | **3,706** | 4,584 |
| Term deposits with initial term of over three months | | **–** | 635 |
| Cash and cash equivalents | 19 | **187,791** | 237,525 |
| | | **1,451,677** | 950,818 |
| **Total assets** | | **7,240,155** | 3,791,108 |
| **EQUITY** | | | |
| **Equity attributable to the Company's equity holders** | | | |
| Share capital | 20 | **198** | 198 |
| Share premium | 20 | **123,021** | 1,100,302 |
| Shares held for share award scheme | 20 | **(606,874)** | (258,137) |
| Share-based compensation reserve | | **1,827,855** | 1,199,663 |
| Retained earnings/(accumulated deficit) | | **246,667** | (140,999) |
| **Total equity** | | **1,590,867** | 1,901,027 |

## Statement of Financial Position - The Company

As at 31 December 2011

| | Note | As at 31 December 2011 RMB'000 | 2010 RMB'000 |
|---|---|---|---|
| **LIABILITIES** | | | |
| **Non-current liabilities** | | | |
| Long-term notes payable | 28 | **3,733,331** | – |
| **Current liabilities** | | | |
| Amounts due to subsidiaries | 11(b) | **1,829,429** | 1,833,802 |
| Other payables and accruals | | **86,528** | 56,279 |
| | | **1,915,957** | 1,890,081 |
| **Total liabilities** | | **5,649,288** | 1,890,081 |
| **Total equity and liabilities** | | **7,240,155** | 3,791,108 |
| **Net current liabilities** | | **(464,280)** | (939,263) |
| **Total assets less current liabilities** | | **5,324,198** | 1,901,027 |

## Statement of Financial Position – The Company

As at 31 December 2013

| | Note | As at 31 December 2013 RMB'Million | 2012 RMB'Million |
|---|---|---|---|
| **ASSETS** | | | |
| **Non-current assets** | | | |
| Intangible assets | | **21** | 10 |
| Investments in subsidiaries | 10(a) | **10,684** | 9,419 |
| Contribution to Share Scheme Trust | 10(d) | **2** | 12 |
| | | **10,707** | 9,441 |
| **Current assets** | | | |
| Amounts due from subsidiaries | 10(c) | **4,934** | 4,906 |
| Prepayments, deposits and other receivables | | **114** | 25 |
| Cash and cash equivalents | 18 | **346** | 166 |
| | | **5,394** | 5,097 |
| **Total assets** | | **16,101** | 14,538 |
| **EQUITY** | | | |
| **Equity attributable to the Company's equity holders** | | | |
| Share capital | 19 | **–** | – |
| Share premium | 19 | **2,846** | 2,880 |
| Shares held for share award schemes | 19 | **(871)** | (667) |
| Retained earnings | | **2,295** | 2,456 |
| **Total equity** | | **4,270** | 4,669 |

## Statement of Financial Position – The Company

As at 31 December 2013

| | Note | As at 31 December 2013 RMB'Million | 2012 RMB'Million |
|---|---|---|---|
| **LIABILITIES** | | | |
| **Non-current liabilities** | | | |
| Long-term notes payable | 26 | **9,141** | 7,517 |
| **Current liabilities** | | | |
| Amounts due to subsidiaries | 10(c) | **2,632** | 2,308 |
| Other payables and accruals | | **58** | 44 |
| | | **2,690** | 2,352 |
| **Total liabilities** | | **11,831** | 9,869 |
| **Total equity and liabilities** | | **16,101** | 14,538 |
| **Net current assets** | | **2,704** | 2,745 |
| **Total assets less current liabilities** | | **13,411** | 12,186 |